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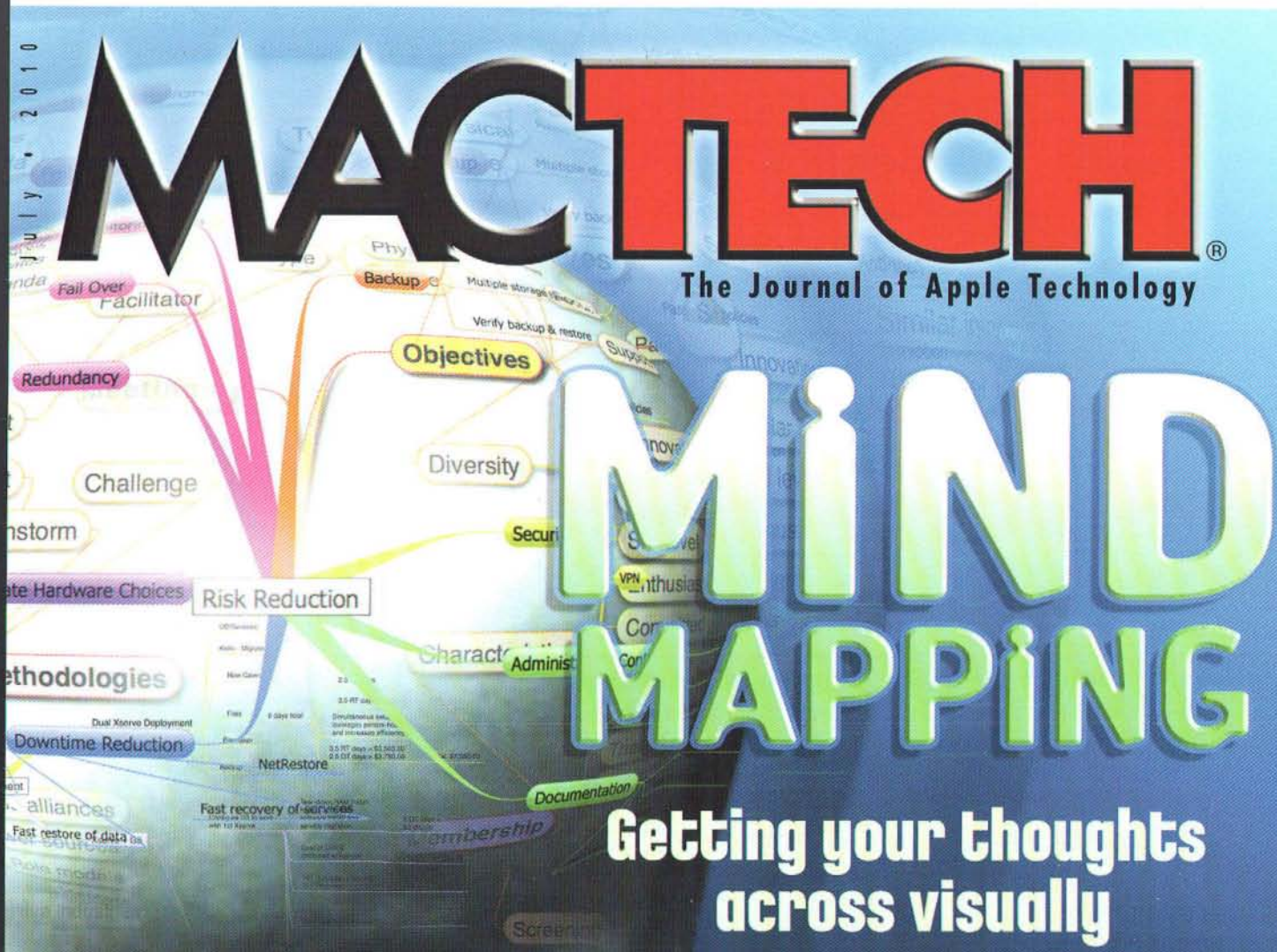

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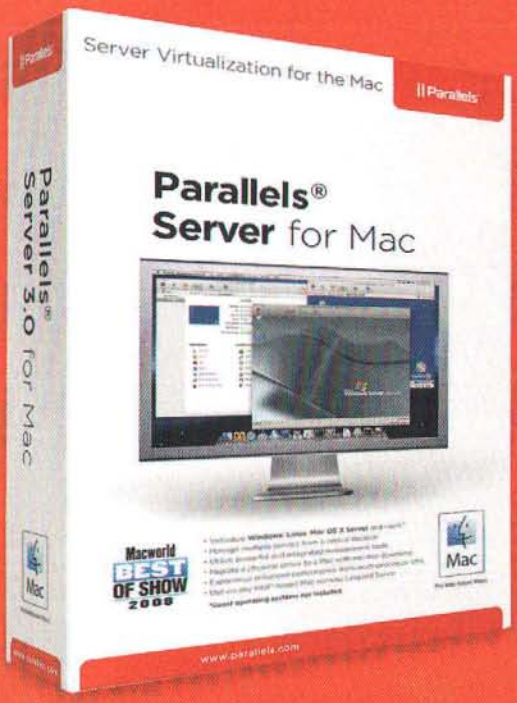

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From the Editor

As announced last month - in *MacTech Magazine* and elsewhere - MacTech is hosting a conference. A tech conference, of course, but it's also more. Hopefully, you've been following along at http://www.mactech.com/conference and @mactechconf on Twitter. As this issue is going to the printer, we're just about to open registration. We're incredibly excited by the ideas that people have been bringing forth and by the schedule that's in place. Even better are the informal discussions and meetings waiting to take place. We're looking forward to seeing you in November.

Speaking of excitement, this month brings some changes that are exciting for everyone. First bit of news is about columnist Dave Dribin. Dave created and has written The Road to Code column in *MacTech* for three years. He has taken readers from how to get started in Mac development through many more advanced topics. Go back and take a look at the first column online (http://macte.ch/mtrtc01) and see just how much ground The Road to Code has covered. Well, Dave is moving on and we want to congratulate him. Thanks for a great three years, Dave, your work here will be missed. Dave leaves us with a review of this year's NSConference.

Also exciting are the possibilities of how *MacTech* will continue to present developer-related content. The first entry is in this very issue: Boisy G. Pitre brings us an article on writing daemons in Mac OS X.

Mike Hjörleifsson brings another installment of CoreSec, "Understanding 802.1x." Need to ensure that only authorized machines access a given network? Need audit trails for machines that access a network? The 802.1x standard is the answer.

Exciting? Adobe has released AAMEE, a utility designed to aid in mass installs of Adobe software. Exciting? AAMEE is possibly not the panacea that Adobe may think it is. Greg Neagle brings his usual experience and pragmatism to a review of AAMEE to help you decide if it's a useful tool for you.

This month's Mac in the Shell tackles math in the shell. Performing math and array operations in bash aren't always the most straight-forward of procedures. This month's column clears up both aspects of bash.

Did you ever get curious about Apple's choice of Objective-C as a language for Mac and iOS development? Michael Swaine shares some facts (and non-facts) about Objective-C, just so you have the background when talking with other developers.

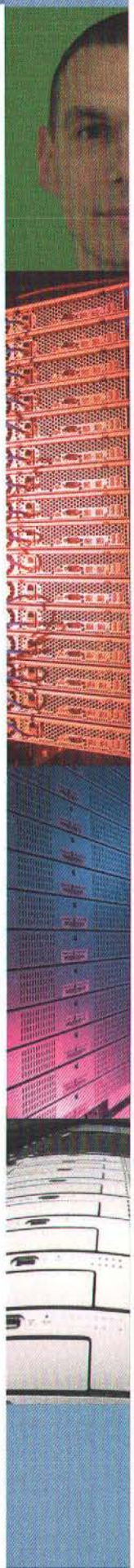
Mihalis Tsoukalos is back with an article that shows you the technique of adding copy and paste ability to a Dashboard widget. If there's anything - particularly a text field - on a widget, people will expect to be able to copy from, or paste to that element. Make sure you know how to implement this.

Our cover story delves into mind mapping. If you're looking for a new way to explore and communicate ideas, mind mapping may be just the tool you need. Apple consultant Shelley Watson shares her experiences using this technique and shares examples of ways it can help you.

This month, the *MacTech* Spotlight finds Jacob Gorban, developer at Apparent Software. Personally, I'm fascinated with anything that lets me use the mouse less in any way possible. It's in this way I found Blast, and by extension, Jacob. Check out what makes him tick in this momth's MacTech Spotlight.

Exciting things are all around at *MacTech*. We hope you join us at MacTech Conference 2010 in November. Until then, though, see you next month right here.

Ed Marczak,
Executive Editor



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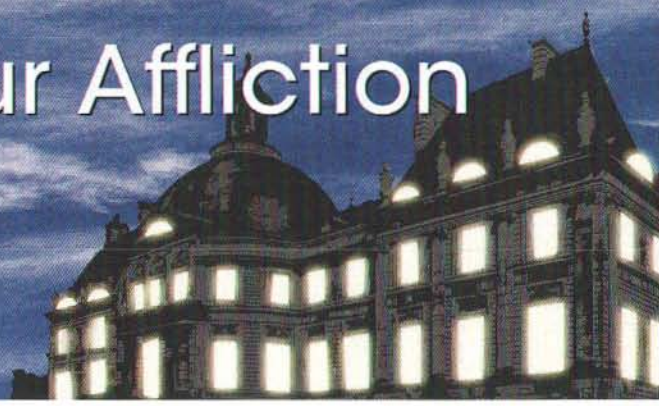
SWAINE MANOR

The Object of Our Affliction

A few facts and non-facts about Objective-C

by Michael Swaine



Objective-C

As the center of the software development universe shifts from computers to mobile devices, many problems and challenges thought to be solved are with us again. As this new/old thing called iOS becomes the center of Apple's software universe, the problem list includes Objective-C. It's the preferred language of iOS app development, inherited from NEXTSTEP along with the NeXT operating system that became Mac OS X and the exile who became the CEO, now woven throughout the fabric of Apple's i-space like some fungal mycelium. Since most of the apps you use will soon be Objective-C-based, I thought I'd share with you a few little-known facts about the preferred language of iPhone development.

Since most of the apps you used will be Objective-C based, I thought I'd share a few little-known facts...

Did you know, for example, that its inventor doesn't use it any more? Brad Cox has moved on to XML, Java, Ruby, Python, and Perl (http://virtual-school.edu/cox/).

Did you know that Java was modeled after Objective-C? One of the creators of Java says so (http://web.archive.org/web/20071030010852/http://www.cs.umd.edu/users/seanl/stuff/java-objc.html).

Did you know that the Cocoa framework of 2002 was nearly identical to the NEXTSTEP APIs of 1992? (http://www.linuxjournal.com/article/6009) Let's call that consistency, because it sounds so much nicer than stagnation.

Memes

But what really matters are the memes and jokes. One of the classic memes is, "If Xs were Ys, what kind of y would x be?" Like, "If programming languages were beers, what kind of beer would be language Y be?" OK, so if programming languages were beers, what beer would Objective-C be? The Internet provides an answer (http://lambda-the-ultimate.org/node/3133), as it does is to every question so long as you don't care about the quality of the answer. If Objective-C were a beer, it would be Pabst Blue Ribbon. I have no idea why.

There is an Objective-C version of the Shooting Yourself in the Foot joke (http://burks.bton.ac.uk/burks/language/shoot.htm). You know: "In C, you shoot yourself in the foot. In Concurrent Euclid, you shoot yourself in somebody else's foot. In Pascal, the compiler won't let you shoot yourself in the foot. In Java, you shoot yourself in the foot and everyone else who accesses your website leaves hobbling and cursing. In Forth, you yourself foot in shoot...." The Objective-C version? "In Objective C, you write a protocol for shooting yourself in the foot so that all people can get shot in their feet." You see the influence on Java, right?

Jozef Dransfield has posted an Objective C Joke of the Day. Apparently just one. Here it is: "Why do they need a garbage collector in Yorkshire? Because they keep calling 'init'!" I can see why the tradition only lasted one day.

There are Objective C versions of the "...is the new..." meme (http://en.wikipedia.org/wiki/The_new_black). You know, "Pink is the new black," "Random is the new order (Apple)," "Black is the new President (Tracy Morgan)." Technically, this is a snowclone (http://en.wikipedia.org/wiki/Snowclone). A search on "Objective-C is the new..." yields:

Objective-C is the new Java
Objective-C is the new Ruby on Rails
Objective-C is the new HTML

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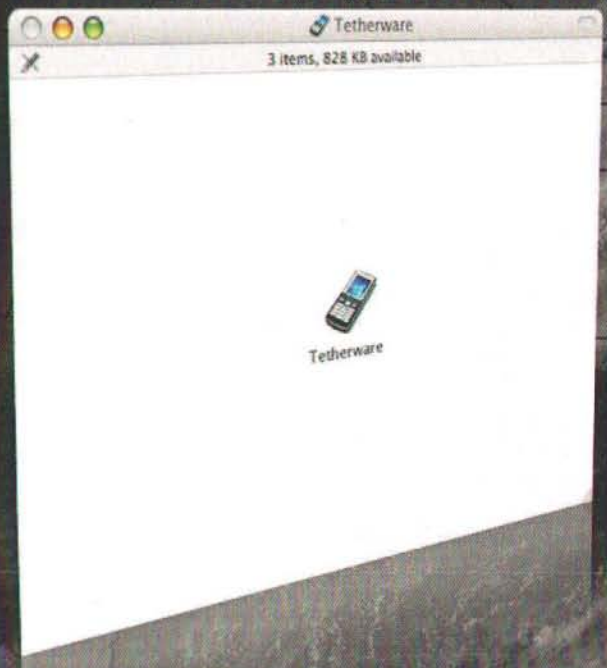

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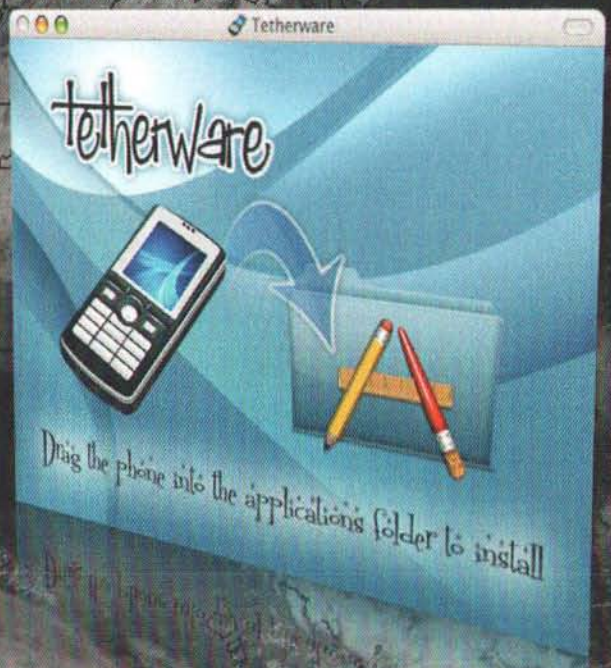

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I dutifully report these results, but I don't think any of these people know what "is the new" means.

But I *keed*. Objective-C is actually a pretty cool language, if a little old, inspired by an even cooler (and older) language, Smalltalk. Anyway, because you always want to leave 'em with something to hum on the way home, there an official Objective-C country song ("Retain My Heart/Or you might point to an invalid memory reference..."), inspired by the inimitable Erica Sadun. Follow the link (http://www.tuaw.com/2010/05/21/rocking-the-objective-c-ountry/) to the audio and sing along.

All together now.

About The Author

Michael Swaine is the former editor-in-chief of Dr. Dobb's Journal (http://www.ddj.com) and current editor of PragPub (http://www.pragprog.com/magazine), the electronic magazine for pragmatic programmers. You can reach him at mike@swaine.com.

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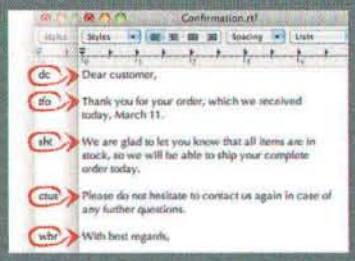

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by Edward Marczak

Math in the Shell

Down to some lesser-used aspects of bash

Welcome

There are several aspects of the bash shell that just seem underutilized. Typically, there are good reasons behind that: some features seem incomplete, or a bit strange when coming to bash from another language. This month, we'll dive into both of these facets of bash by talking about performing math operations and dealing with arrays. Read on to learn more about these features which are really nice to have in a pinch.

Arrays

Let's start with arrays and build up from there. An *array* is a data structure that group similar elements, each selected by one or more indices. At a lower level, each index is just a pointer to a location in memory. Since these elements are typically all of fixed storage size, the locations are typically predictable. Modern versions of bash support arrays directly, with no funny workarounds.

You've likely worked with an array data structure in some context before, perhaps even another programming language like Java, C or Python. Bash supports basic, one-dimensional arrays. Index values are positive integers beginning at zero (bash arrays are *zero-based*). One problem to note now: non-integer values for an index silently covert to zero, the first element of the array. Be careful of this.

Arrays "just work" when used. Third line here creates an array:

```
color="blue"
path="/Users"
username[0]="mike"
```

There is no need to start at zero, though. Nor is there a need to keep a strict order. The following will also create an array, this time with three elements:

```
errmsg[15]="Off by one error"
errmsg[10]="Out of bounds error"
errmsg[22]="Bus error"
```

Arrays can also be explicitly declared using the *declare* keyword:

```
declare -a arrayname
```

Finally, arrays can also be created and initialized with values using parenthesis. Each value is separated by spaces:

```
colors=( red green blue yellow 'light orange' black )
```

This method of initialization allows for a nice trick: using command substitution to fill the array:

```
colors=( $(< "colors.txt" ) )
```

...given a text file that contains:

```
red
green
blue
brown
mauve
black
```

...or whatever you deem necessary. This allows an array to change at each run without altering the script itself. You may sometimes see this done with a cat statement: `colors=( $(cat colors.txt) )`. This isn't *awful*, but it does spawn another process, so, it's not quite as nice as the built in redirection that will neatly read the file into the array.

Why does this work? Isn't the array supposed to be separated by spaces? Well, yes. Bash will silently auto-convert the newline character to a space and initialize the array properly. Nice!

To access elements of an array, you *must* use curly braces:

```
echo ${errmsg[15]}
```

Arrays have some special subscripts that make working with them easier. First, is the '@' subscript, representing all elements. Given an array named `colors`, the following will print every element in the array:

```
printf "%s\n" "${colors[@]}"
```

Of course, you may also want to act on each element of the array, which is an ideal job for a loop:

```
for color in "${colors[@]}"; do
```

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```
  echo $color
done
```

As shown last month, the '#' symbol returns the length of a variable. When used with an array, it returns the count of elements in the array.

```
colorcount=${#colors[@]}
```

I won't pretend that this covers *everything* about arrays in bash, but it does cover the necessary basics and is more than enough to be useful.

Array Example

As an example, I recently wrote a quick script that creates a short report of file changes in a ticket database. However, these changes are many to one: many different files could point to the same ticket number. I tracked this using an array.

When retrieving the file, I look up its ticket number. Once found, I test $file_desc[$ticket_no] for a description. If it exists, no need to re-add it. If not, I add the description found and move to the next file. The process looks something like this:

```
for file in $(cat filelist.txt); do
  ticket_no=$(lookup_ticket $file)
  if [[ $file_desc[$ticket_no] == "" ]]; do
    $file_desc[$ticket_no]=$(get_desc $ticket_no)
  fi
done
```

From there, I get to dump out each entry in $file_desc for the report. That's a nice, basic example that uses several of the concepts introduced above.

Math

Like arrays, math in bash has gotten easier in contemporary releases. I won't go deeply into the conventions of the past, only to note that if you examine an older script written by someone else, you're likely to see several conventions and keywords. Consider all of the following deprecated:

The 'let' keyword: `let x=7+7`
The 'expr' keyword: `expr 6 / 3`
Square brackets: `echo $[2 + 2]`

Modern versions of bash include arithmetic expansion for expressions enclosed in double-parenthesis:

```
echo $(( 1 + 1 ))
```

or

```
a=$(( $b + $c ))
```

This is much more simple and consistent, right? There's also a compound command that maps to true and false for purposes of testing values without the need to expand them:

```
if (( $a == 5 )); then
  echo "a is 5! Exciting!"
fi
```

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The bash man page, under the section, "Arithmetic Evaluation," lists the operators that the shell understands in order of decreasing precedence:

id++ id— variable post-increment and post-decrement
++id —id variable pre-increment and pre-decrement
- + unary minus and plus
! ~ logical and bitwise negation
****** exponentiation
*** / %** multiplication, division, remainder
+ - addition, subtraction
<< >> left and right bitwise shifts
<= >= < > comparison
== != equality and inequality
& bitwise AND
^ bitwise exclusive OR
| bitwise OR
&& logical AND
|| logical OR
expr?expr:expr conditional operator
= *= /= %= += -= <<= >>= &= ^= |= assignment
expr1 , expr2 comma

The order of evaluation follows the common math "PeMDAS" rules: (left-to-right), Parenthesis, Multiplication, Division, Addition and then Subtraction. Parenthesis can override ordering rules. Some examples:

```
$ x=10
$ echo $(( $x / 2 ))
5
$ echo $(( $x + 3 ))
13
$ echo $(( (2+3)**2 ))
25
```

Now, you may have seen the list of operators, gotten excited and ran off to try some of this exciting bash math out on your own. Of course, you got up to division and tried "echo $((3/4))" only to get a result of "0". Is this a bug? What gives?

Adding Complexity

You may have noticed one thing about the math examples given: They all evaluate to integer-based results. This is not a bug, it's just all that bash can handle. Integer math is built in and perfectly applicable for many situations. What if you need floating-point results? You're not out of luck, but the solution is not built in to bash.

`bc` is a binary—external to bash—that has shipped with every version of OS X I've ever tested it on (this includes 10.3 and up; I can't vouch for 10.2 and earlier. I hope you're not still targeting 10.2 and earlier for anything at this point, though).

`bc` is a "calculator language" that uses arbitrary precision numbers for calculations. You read that right: it's a "language." While the full language resembles C to a large degree, don't be scared off, as the basics are really accessible. Here's a basic example:

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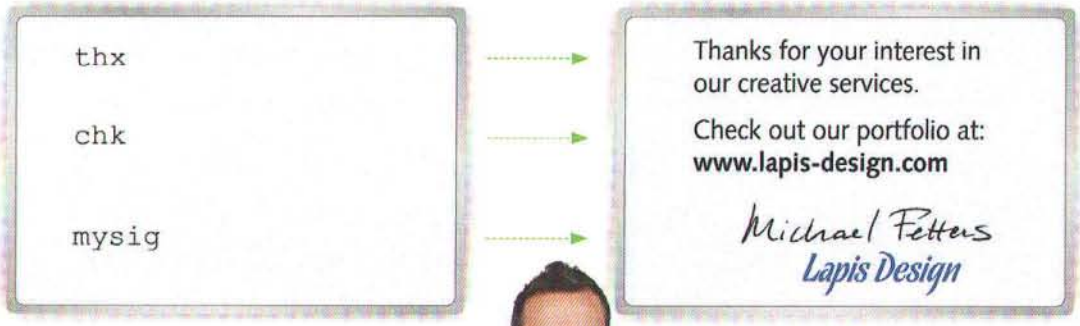

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```
$ echo "2.7 + .8" | bc
3.5
```

We're 'echo'ing the equation to a pipe, to be picked-up on stdin by **bc**. Pretty easy, right? One caveat to this: if all values are integers, bc will want to produce an integer result by default. This causes our earlier example to *still* fail, even with bc:

```
$ echo "3 / 4" | bc
0
```

The solution is to provide a *scale*, or, the precision. *Always* provide a scale for bc to use:

```
$ echo "scale=2; 3 / 4" | bc
.75
```

Use command substitution to store the value in a variable:

```
$ result=$(echo "scale=2; 3 / 4" | bc)
$ echo $result
.75
$ final=$(echo "scale=2; $result * 7" | bc)
$ echo $final
5.25
```


You can even make this a little easier by defining a bash function to handle arbitrary math for you. Try the following in your .bash_profile:

```
function calc() { echo "scale=4; $1" | bc; }
```

From there, you can do this:

```
$ calc 5.5/2.3
2.3913
```

or this:

```
$ calc '(5.2 + 3.6) * 3'
26.4
```

Note the quotes used to group expressions that contain spaces or parenthesis.

Conclusion

While it's really easy to simply use bash to string together commands to run in sequence, check exit codes and possibly add some conditional logic, bash has developed into a much more capable scripting environment. While I fully endorse moving on from bash once a script has hit a certain threshold of complexity (or you foresee the complexity before beginning), there's a utility in being able to run quick-and-dirty scripts for one-off jobs or for a quick prototype. Also, while *you* may not press all of these concepts into service in bash, it should let you dissect scripts that come from others who do take bash scripting to the extreme.

Media of the Month: *Firefly: The Complete Series*. If you haven't seen this sci-fi gem, it's available on DVD, Netflix and in iTunes.

We certainly hope to see you at the first MacTech Conference in November.

See http://www.mactech.com/conference for more information.

About The Author

Ed Marczak is the Executive Editor for MacTech Magazine, and has written the Mac in the Shell column since 2004.

CORESEC: SECURITY TOPICS FOR ADMINISTRATORS AND PROGRAMMERS:

Understanding 802.1x

Network access controls keep unauthorized machines off the network.

By Michele (Mike) Hjörleifsson

Enemies At The Gate

Welcome back to CoreSec. Last month we discussed the Payment Card Industry's (PCI) security requirements that apply to anyone making credit card transactions in retail or online stores. This month we will take a look at preventing unauthorized access to your network, wired or wireless, to help achieve some of the points required in PCI and other regulatory requirements. More importantly, controlling access to your network and the resources therein should be the mantra of any administrator.

When administrators consider network security, typically firewalls and wireless routers come to mind. While wireless security has come some distance since its inception, shared passwords have an inherent management issue for medium to large infrastructures. When someone leaves or is dismissed, the person's password must be reset on all the devices accessing the network. Additionally, how do administrators ensure that unauthorized equipment and users don't gain access via a conference room Ethernet jack or some other wired port, like a network printer's Ethernet jack? This is where the 802.1x methodologies come in.

Introduction To 802.1x

802.1x, not to be confused with 802.11(a/b/g/n), is not a wireless standard; rather it is a set of network access standards originally proposed by 3Com, HP and Microsoft and accepted by the IEEE (Institute of Electrical and Electronics Engineers) in 1999. The standard was initially developed for controlling access to wired networks and is now used for both wired and wireless. Though this may seem very technical and vague, it's quite the opposite. If you have ever visited a hotel hooked up to their wired or wireless network and had to enter a username and password, odds are you have used 802.1x. While this is a simple example, it still accomplishes the purpose of keeping unauthorized computers off the wired or wireless network. There are as many ways to implement 802.1x as there are brands of network equipment, but some simple principles apply to all 802.1x implementations. Let's take a look.

One of the side benefits to implementing 802.1x, other than the obvious layer of authentication control to the network, is that it can be used to prevent "hubbing," or connecting a hub to an Ethernet port designated for a single device and then hooking up numerous unauthorized devices to that port.

The Basics

There is a minimum of three parties involved in an 802.1x authentication session: the supplicant, authenticator and authentication server. The authenticator acts as the security guard ensuring that any device or user attempting to access the network is properly authenticated; it receives credentials from the supplicant and forwards them on (often called proxy) to the authentication server.

The supplicant is a piece of software or firmware on a device that communicates with the authenticator and sends the required authentication credentials (typically encrypted). Why didn't I just say username and password? Well, because the credentials may be a PKI (public key infrastructure) certificate used to validate a device or a username and password combination or a combination of the two (more on this later). The supplicant can leverage one of several published standards. The standard used is typically determined by the existing networking equipment (switches, wireless access points etc.). The current standards are:

EAP-TLS: Transport Layer Security.

EAP-TTLS: Tunneled Transport Layer Security.

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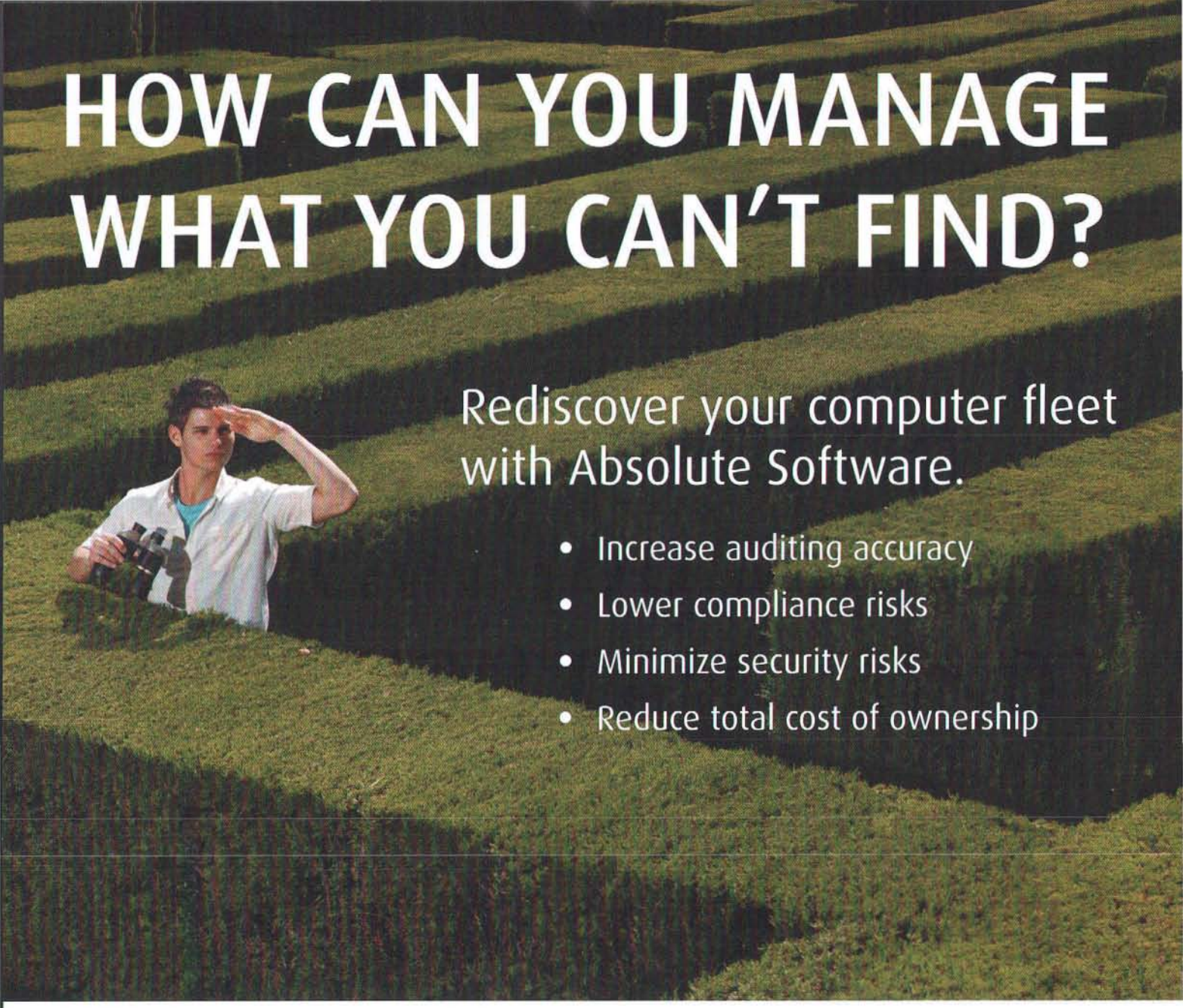

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PEAP: Protected EAP.

LEAP: Lightweight EAP —Original standard, deprecated [Cisco Std].

EAP-FAST—Flexible Authentication via Secure Tunnel. [Cisco Std]

EAP-SIM—Subscriber Id. Module. Used by GSM networks [Cisco Std]

EAP-MD5—Message Digest Algorithm (For Wired Networks Only)

The authentication server, typically a RADIUS (Remote Authentication Dial In User Service) service running on an existing server or workstation provides the authentication of the user or device and, once validated, gives the "ok" to the authenticator to allow the user or device onto the network. Why does this technology use RADIUS? RADIUS was used for many years as a method for providing rapid authentication to dial-up users connecting to services like America Online, MSN and NetZero. It has proven itself to be a reliable, fast method of authenticating network access. So this sounds like it's going to add one more layer of complexity to your network with yet another set of credentials for the user to remember right? Not so. Most RADIUS implementations like those from Apple, Microsoft and even Cisco interface with your existing directory infrastructure to allow users to utilize their existing credentials, and do so quite seamlessly. Providing 802.1x is typically a four-stage process:

1. Initialization – When the authenticator detects a port coming live on a wired network or a new device on the wireless network, 802.1x traffic is allowed to and from that device but all other traffic is dropped.
2. Initiation – The authenticator regularly broadcasts identity request frames at layer 2 (the data link layer of the OSI model) on the local network segment. The client device's supplicant is set up to listen for these requests and upon receipt of the identity request responds with an identifier.
3. Negotiation – The authenticator will request a session with the authentication server which provides the EAP standards available to use. The authenticator then negotiates the EAP standard with the supplicant. Of note here is that the supplicant is still not on the network nor is it fully authenticated. The negotiation settles on the standard to be used between the parties and the supplicant securely transmits the credentials.
4. Authentication – Upon receipt the authenticator will proxy the credentials to the authentication server and if accepted the supplicant is informed via an EAP acknowledgement and then allowed to access the network.

An Example Implementation Walkthrough

Implementing 802.1x can seem pretty daunting but in Apple's typical fashion they have made implementing 802.1x with Mac OS X Server and the Airport Express or Extreme quite

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simple. Let's take a quick walkthrough of how simple it truly is to take your wireless network authentication to the next level.

Before we get started, we need to address a chicken and egg situation produced by the nature of wireless communication. How do you manage a machine that is connected wirelessly to the network without the user being logged in to the network and hence authenticated against your 802.1x? This has prevented many an administrator from implementing 802.1x, as they tend to apply patches, perform installations and other administrative tasks during maintenance cycles when users are not (or at least shouldn't be) logged in.

One solution would be to use device authentication only. If the device is an authorized device than it can talk to the network. However, this is somewhat limiting— it doesn't provide any user level auditing capabilities and if an unauthorized person gets hold of a laptop, they have access to your network. In Snow Leopard, Apple has resolved this issue with mixed mode authentication in the supplicant. This provides both device level and login level authentication. The device is authenticated to the network prior to the login screen window becoming active by using its machine credentials; this allows administrators to administer the device without a user being logged in. Once users attempt to or successfully enter their credentials, login mode is initiated and an 802.1x session is re-established based on the user's credentials, ensuring only authorized users have access to the network. In a follow-up article next month, we'll see how to use certificate-based authentication and make this process more secure.

So let us set this up. On the OS X server, add the RADIUS service to your list of available services in Server Admin. Use the Assistant button to automatically configure RADIUS and specify your Airport Extreme (Time Capsule or Airport Express will work as well).

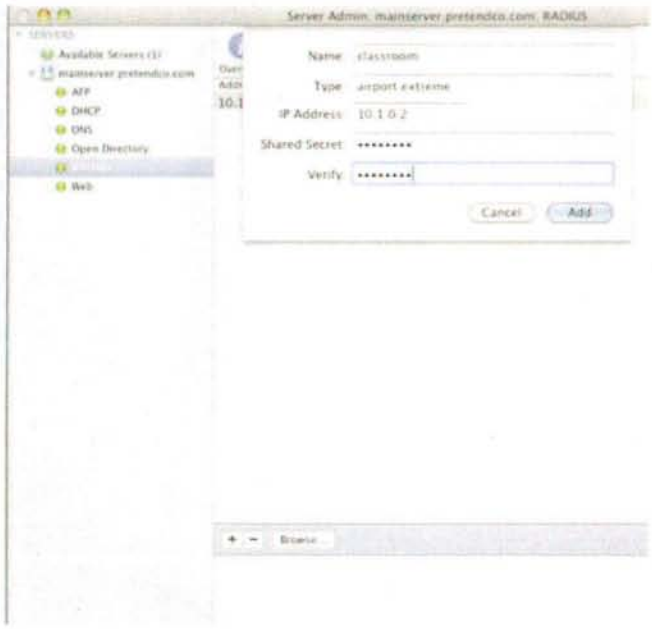


Figure 1 – Associating your AirPort to a RADIUS server.

Be sure to specify a certificate for the RADIUS communication as seen below. Notice there is an Edit Allowed Users button that can be used to restrict access to the network via a Service Access Control entry. Unauthorized users will not even be permitted to start the 802.1x conversation.

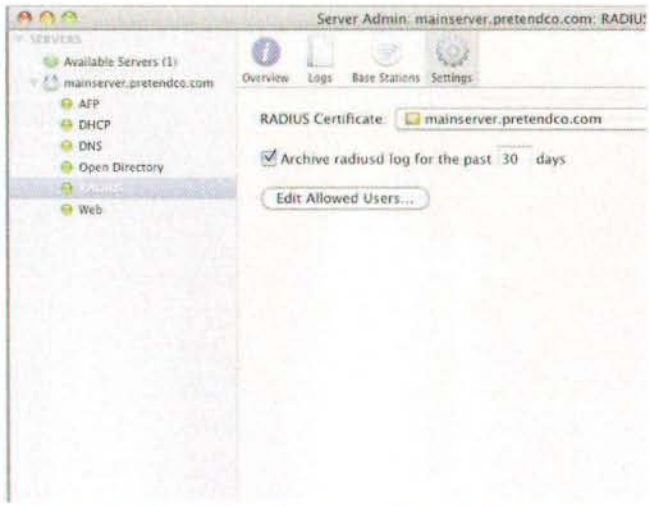


Figure 2 – RADIUS certificate and user authentication

That's all there is to setting up the server side. Now, for your client machines, you can create an 802.1x profile on one machine and either deploy it using an installer package or via UNIX commands in ARD. To set up the client machine for mixed mode 802.1x, open System Preferences and the Network pane. Click on the Airport you want to configure and then click the Advanced button.

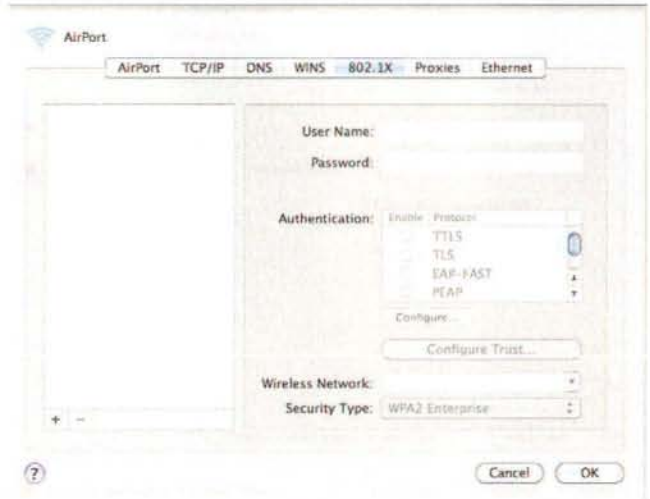
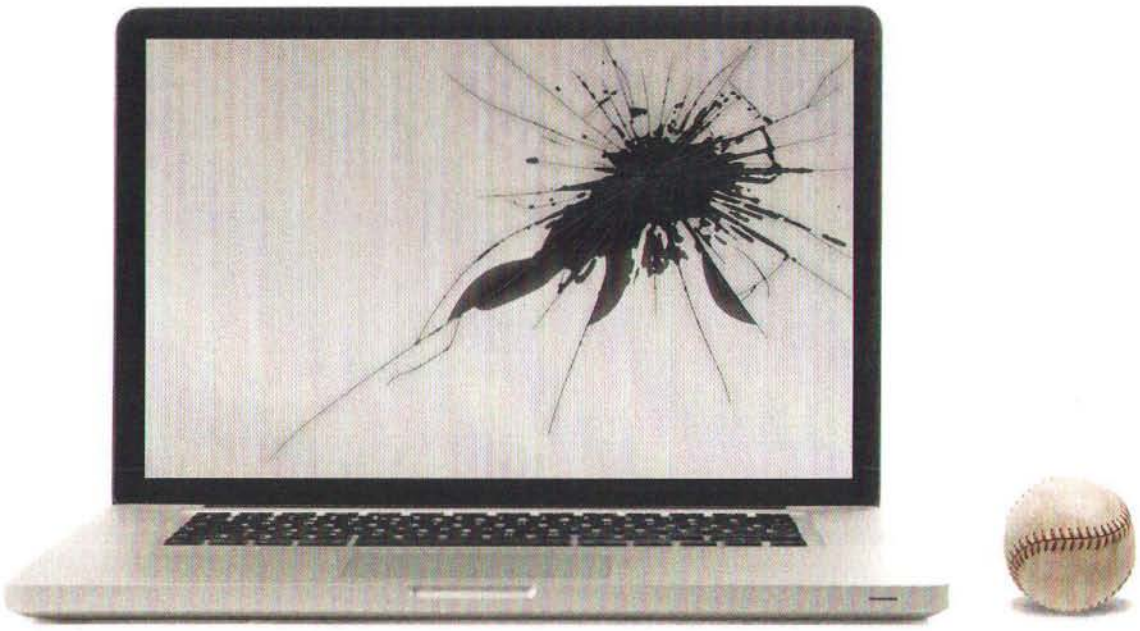


Figure 3 – Client side 802.1x default setup

Select the 802.1x tab and then create two profiles, a system profile (seen below) with a system wide device username and password (not the user name and password).



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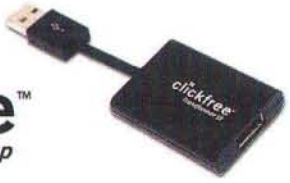

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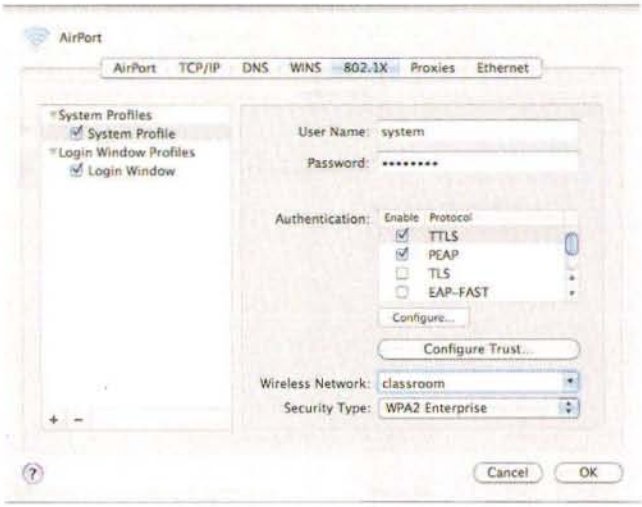

Figure 4 – 802.1x setup for mixed-mode

Add a login window profile, leave the default Authentication EAP types for both profiles and specify the wireless network name and set the Security Type as WPA2 Enterprise. Don't enter the user's credentials into this window. Next, turn on the Airport, authenticate and off you go. Now, only users with proper credentials and an authorized device will be able to get access to your wireless network, no exception. One caveat here is if you are using a self-signed certificate on your server, you will have to install that certificate as trusted on your client machines. Once configured on one client machine the 802.1x profile can be exported and command line tools can be used to deploy this profile en masse.

Enemies Inside The Gates

So now that you are all set protecting against the enemies at the gate, what about the enemies who are already inside the gates? As indicated from most sources, data theft is primarily an inside job not some scheme from hideous hacker consortiums. So how do you protect against these threats internally? Any advanced network switch or wireless access point will support something called VLAN (virtual LAN) swinging. After authentication by 802.1x the user or device is placed into the appropriate VLAN where VLAN security is applied preventing prying eyes from accessing information they shouldn't have access too, such as iPhone 5g specifications or schematics. The combination of firewalls, 802.1x and VLAN security technologies provides an auditable, multi-tiered approach to preventing breaches from outside and within organizations.

More Advanced Techniques

There are some newer access control techniques being developed and in some cases implemented that should be mentioned here. Port knocking, one such technology seems to be getting some traction. Port knocking is typically used in a firewall but can be used for internally firewalling restricted resources. Technically, port knocking uses a connection attempt on a set of ports in a certain sequence (like a secret door knock for your clubhouse when you were a kid), which opens access to the requesting user if the sequence matches the authentication sequence. Another technology is packet level authentication and auditing, where the TCP header has an authentication value of some type generated by software on the client which is used to authenticate and audit every packet sent from the client through the firewall or network switch. Both of these technologies are adolescent in maturity and haven't received wide industry adoption yet. But, that may change and there are several successful open source projects for both of these technologies.

Conclusion

In a society inundated with information and threats to personal information, stepping up your security posture is never a bad idea and 802.1x provides a robust method to take your network security to the next level without a ton of cost or administration. It is the goal of this writer and this monthly column to make you aware of issues such as these and help you address them in your organization. We strive to make this column as pertinent to you, the reader, as possible so please feel free to email mikeh@mactech.com and provide feedback or topics you would like to see addressed in our upcoming editions. Stay safe, and secure.

About The Author

Michele (Mike) Hjörleifsson, co-author of the Apple Training Series: Security and Mobility courseware has been developing on the Apple platforms since the Apple][+, implementing network and remote access security technologies since the early '90s, and worked with the nation's largest corporations and government institutions, authoring white-papers, technical magazine articles and topical discussions at IETF (Internet Engineering Task Force), and other organizations on security topics, and podcasting with Apple Podcast Producer. He is currently working with companies worldwide on Apple and Security consulting projects and conducting Apple IT and Pro Apps training. Feel free to contact him at mhjorleifsson@me.com

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Meet AAMEE

An introduction to Adobe Application Manager, Enterprise Edition

By Greg Neagle, MacEnterprise.org

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Mac OS X enterprise deployment project

Introduction

In this month's MacEnterprise, we'll take a look at Adobe's new tool for preparing Creative Suite 5 products for installation in an enterprise environment. This tool is called "Adobe Application Manager, Enterprise Edition," or "AAMEE" for short. We'll examine how it works, what it does, and how it unfortunately falls short of its promise.

History

Installing and removing Adobe products has always been a challenge in an enterprise environment. There have been two key issues. The first has been that Adobe products have not generally been distributed in the Apple package format, which would allow them to be installed using familiar tools – the same tools you'd use to install virtually any other piece of software in your organization. Secondly, not only have Adobe products been distributed in their own format, but Adobe has used may different installation formats.

Creative Suite 3

For Adobe Creative Suite 3, Adobe documented a method to create "silent installs" of Adobe CS3 products. These silent installs allowed the administrator to customize which applications in a suite were installed, allowed the administrator to pre-license the applications, and also to optionally disable automatic updates, registration dialogs, and the End-User License Agreement dialog.

To create such a silent installation, the administrator needed to run the Adobe CS3 "Setup" program via the command-line with a special "—record=1" switch. After making installation choices, a couple of XML files were generated describing which Adobe CS3 components were to be installed or removed. Additionally, the administrator needed to hand-create an additional XML file containing licensing and other configuration information, then copy that to a specific folder among the product payloads. Finally, the administrator needed to run a command-line process that used the installer payloads and the XML files to "silently" install the Adobe CS3 product. You can read more about the Adobe CS3 deployment process here:

http://www.adobe.com/support/deployment/cs3_deployment.pdf

This solution had some issues. The process of creating all of the needed files and getting them all in the right places was tedious and error-prone. Even when the administrator got everything correct, the "silent" install wasn't really silent. An icon for the Adobe Setup program appeared in the Dock during installation, and various disk images would appear and disappear from the desktop while the install occurred. Still, these techniques made it possible to deploy the Adobe CS3 products in an automated fashion.

Creative Suite 4

When Adobe released Creative Suite 4, they attempted to address at least one of the major issues with the deployment solution for Adobe CS3. They still supported a workflow similar to that used with the CS3 products, but they also introduced a new tool – the Adobe Enterprise Deployment Toolkit. This tool helped create installation "packages" which encapsulated the files needed to perform a successful "silent" install. Adobe also wrote more in-depth documentation on deployment and provisioning planning and implementation. You can download the CS4 Enterprise Deployment Toolkit and supporting documentation here:

http://www.adobe.com/devnet/creativesuite/enterprisedeployment.html/#cs4_edt

While the new tools and documentation were helpful, truly silent installs were still not possible, as the Setup icon still appeared in the Dock and disk images still appeared on the desktop. More importantly, as with the previous solution, deployment workflows that relied on standard Apple packages could not be used.

Some commercial software deployment tools added support for the Adobe deployment workflow; first adding

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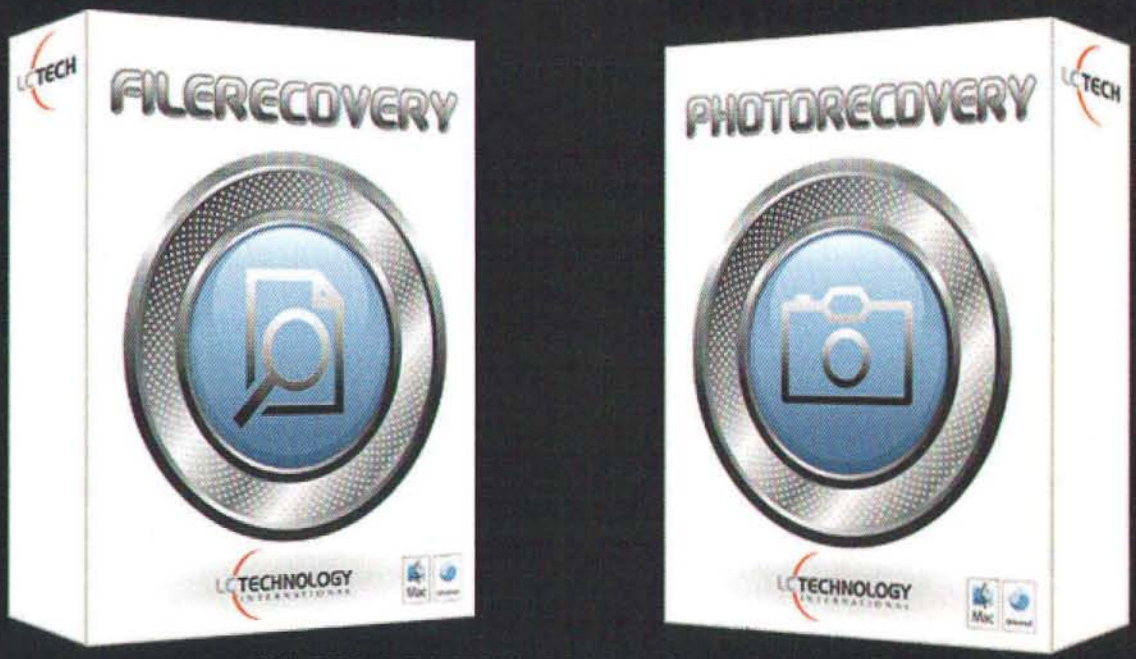

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support for Adobe CS3 installs, and then later adding support for CS4.

Other Adobe products

This actually leads to yet another problem with the Adobe deployment tools – there are too many! Each of the following Adobe software items has a different style of installer, requiring a different workflow:

Adobe CS3 product
Adobe CS4 product "packaged" with Enterprise Deployment Toolkit
Adobe CS3/CS4 product updates
Adobe Acrobat Pro
Adobe Acrobat Pro Updates
Adobe Reader

The frustration here is that the additional work mastering the deployment of one Adobe product might not carry over to the deployment of another Adobe product – through the release cycles of the CS3 and CS4 products there were six different styles of Adobe "installers" to deal with.

Creative Suite 5

Enterprise customers made their dissatisfaction with the Adobe CS3 and CS4 deployment tools known. Adobe announced that with the release of Adobe Creative Suite 5, they would provide tools that allowed enterprise administrators to create Apple Installer packages to deploy Adobe CS5 products. This would allow enterprise administrators to use the same tools and workflows to deploy CS5 products that they already use to deploy most other software.

Enterprise administrators rejoiced at this news. While the Apple Installer package format is not perfect, it is well understood and supported by a wide variety of tools, and many administrators are familiar and comfortable with working with Apple packages.

In early June 2010, Adobe released a "preview" of Adobe Application Manager, Enterprise Edition (AAMEE). With this tool, administrators can build an Apple Installer package from Adobe CS5 installation media. This package can then be used in workflows that utilize the Apple-style packages.

Working with AAMEE

After downloading and installing AAMEE from the disk image available at http://www.adobe.com/devnet/creativesuite/enterprisedeployment.html, you'll find the tool itself installed at this obscure location:

```
/Library/
   Application Support/
      Adobe/
         OOBE/
            PDApp/
               Enterprise/

AdobeApplicationManagerEnterpriseEdition.app
```

The installer helpfully launches AAMEE for you after installation, but if you ever want to run it again in the future, it's helpful to know where it is.

Once launched, AAMEE reveals itself as an Adobe AIR-based application, complete with non-standard user-interface elements. You must name the installation package you want to create, specify where to save it, and select the Adobe CS5 product installation folder, typically from a mounted disk image or physical DVD. The welcome screen is shown in Figure 1, with some values for building an installer package for the Adobe Production Premium CS5 suite.

Figure 1 – AAMEE Welcome screen

Subsequent screens allow you to enter a serial number (or choose to install without a serial number), select which components of the suite to install, and disable product registration dialogs, automatic updates and the like. These final choices are depicted in Figure 2.

Figure 2 – Deployment configuration options

After you've made all your choices, AAMEE will build your package, which will take several minutes. Figure 3 shows the build in progress.

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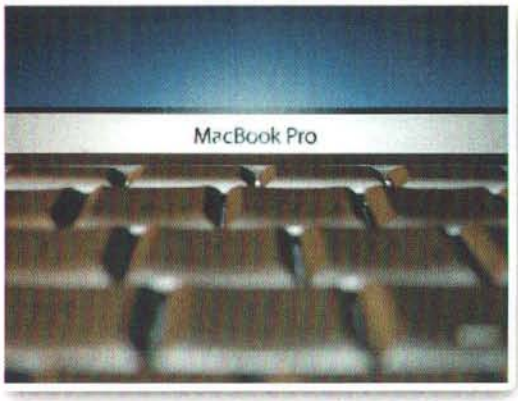

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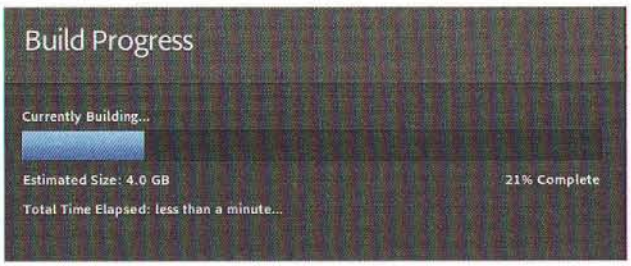

Figure 3 – AAMEE builds the package

When it's done, you are shown a results Summary screen. You can then quit AAMEE.

Let's examine AAMEE's output. Look in the location we specified as the Save to: location in AAMEE's Welcome screen. There will be a `Build` folder and an `Exceptions` folder. In the `Build` folder, you'll find two packages. In the example shown back in Figure 1, I used the package name "CS5ProductionPremium," so the two packages in the `Build` folder are named "CS5ProductionPremium_Install.pkg" and "CS5ProductionPremium_Uninstall.pkg."

You can now test the AAMEE-generated packages in your deployment workflow. Use the "*_Install.pkg" to install the Adobe CS5 product, and the corresponding "*_Uninstall.pkg" to remove the CS5 applications.

Anatomy of a Package

Let's dig into the guts of the Install.pkg. Control-click CS5ProductionPremium_Install.pkg, and choose Show Package Contents from the contextual menu. Navigate into the `Contents` subfolder. If you've examined the contents of an Apple package before, so far everything should look familiar, and similar to Figure 4.

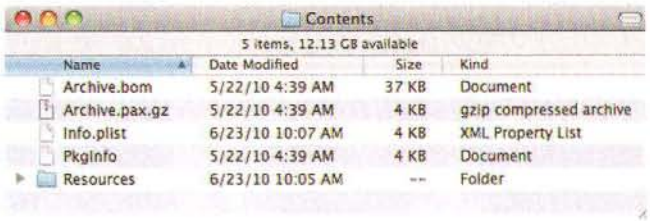

Figure 4 – Contents of CS5ProductionPremium_Install.pkg

In a standard Apple bundle-style package, the files to be installed are compressed in the `Contents/Archive.pax.gz` file. But in the AAMEE-created package, the `Archive.pax.gz` file is far too small to contain all the files in Adobe Production Premium CS5! The contents of `Archive.pax.gz` are listed in `Archive.bom`. We can list the contents with the `lsbom` tool:

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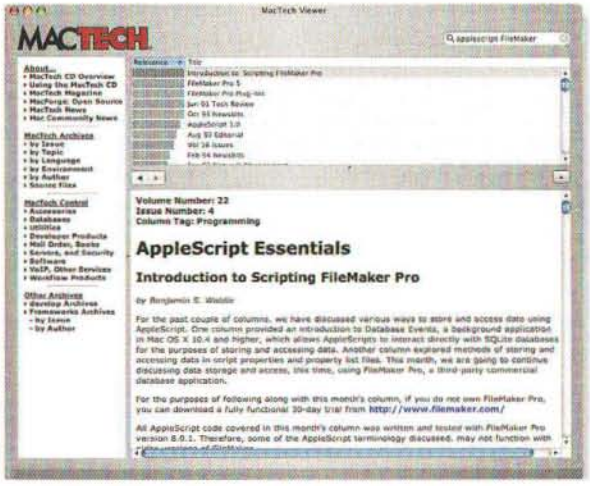

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```
% cd /Users/Shared/CS5ProductionPremium/Build/
% cd CS5ProductionPremium_Install.pkg/Contents/
% lsbom Archive.bom
.   40755   501/20
```

That's an empty archive – no files are being installed from this archive! More investigation is needed. Let's look in the Resources folder, as shown in Figure 5.

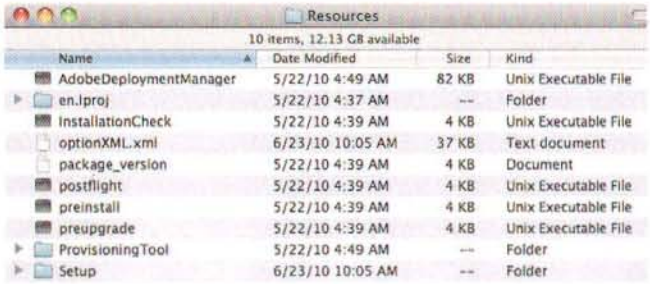


Figure 5 – Contents/Resources of CS5ProductionPremium_Install.pkg

Apple packages support optional scripts that can run before and/or after the installation of the archive contents. In the Resources folder, we can see three of these scripts: postflight, preinstall, and preupgrade. A little investigation, and we discover that the preinstall and preupgrade scripts (which in this case are essentially identical) are doing the actual installation. They are calling the included `AdobeDeploymentManager` program and use installation payloads located in the `Setup` folder. These payloads are identical to those found on the original installation media.

AAMEE Package Issues

What we have, then, is not really a true Apple package, but rather an item with the structure of an Apple package that exists to run the Adobe installer from a preinstall/preupgrade script. While this works, this unusual design has some definite shortcomings:

Receipts – a normal Apple package leaves behind a receipt that contains information on what files were installed. While AAMEE packages do leave receipts behind, these receipts have no info on installed files, since the bom file is empty.

Progress info – Apple's Installer.app and `/usr/sbin/installer` give progress-done feedback when installing a package. Since AAMEE packages do not have traditional payloads, you get no meaningful progress feedback from Apple's tools. Since AAMEE packages are intended for silent installs, presumably Adobe does not see this as a major issue. Still, admins who are installing CS5 products via an SSH or ARD session might like progress info for the lengthy CS5 installs.

Disk space usage – on Mac OS X 10.5 (Leopard), after a package is installed, a Receipt is created in `/Library/Receipts`. This receipt is made from the original package minus the `Contents/Archive.pax.gz` file. Due to the design of AAMEE packages, this means that the entire `Contents/Resources/Setup` folder, with all of the Adobe Setup payloads, is copied to `/Library/Receipts`, requiring several gigabytes of space. The postflight script deletes all the extra data, freeing up the space once again, but the extra space is needed to complete the install. On Leopard, this can raise available disk space requirements to up to double what would be required if the AAMEE packages were of a more conventional design. This issue does not affect Snow Leopard because package receipts on Snow Leopard are made of just the bom file and a plist with some package metadata.

The AAMEE package design also makes it difficult, if not impossible to use AAMEE-generated packages in modular imaging workflows, like those made possible with InstaDMG, Apple's System Image Utility, or DeployStudio, to name a few. These workflows install software on a volume other than the current boot disk as part of building an install image for mass deployment, or when initially building a Mac.

More serious issues

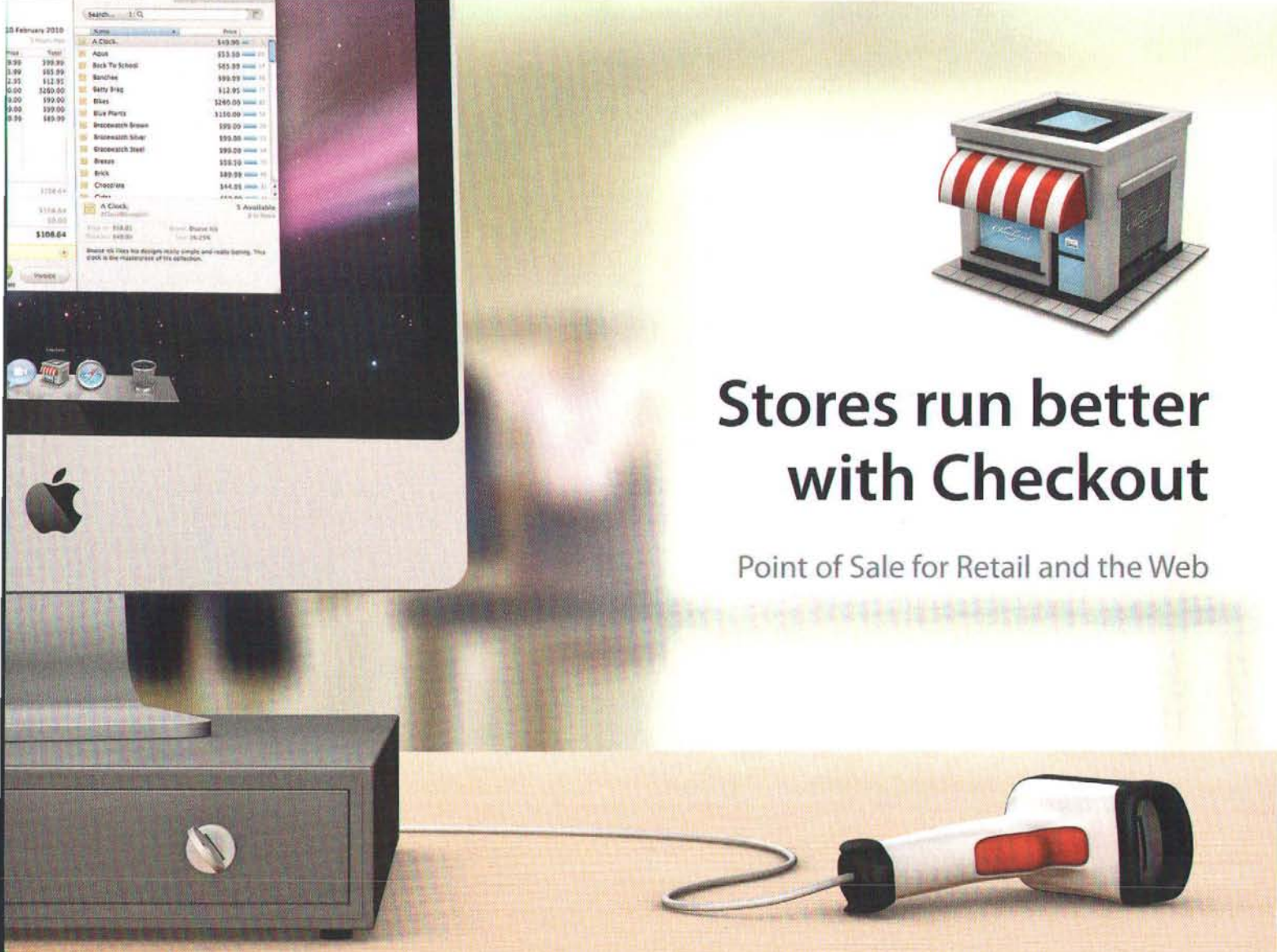
Most of the issues above are annoyances, or have clear workarounds. But there are three more serious issues that make using AAMEE-generated packages for mass deployment of the Adobe CS5 products very difficult in practice.

The first issue is that AAMEE-generated packages will not install from mounted disk images. It's very common to wrap bundle-style packages into a disk image. The resulting disk image is a single file, instead of the multiple files and directories that make up a bundle-style package such as those generated by AAMEE. Disk images are easier to store on non-Apple file systems, and to store on and download from web servers. It is also a common workflow to simply mount these disk images and install directly from the attached volume. But AAMEE-generated packages do not work correctly in the scenario; the Adobe Setup program throws an error and quits.

One workaround for this issue is to copy the package from the mounted disk image to elsewhere on the local disk and install from the copy; this again increases the needed disk space. In a worst case, a package for Adobe Master Collection might need almost 50GB of available disk space to install: 12GB for the disk image; 12GB for the copy to the local disk; 12GB (temporarily) for the receipt under Leopard, and 12GB or more for the actual installation!

Though I have confirmed that other Mac OS X administrators have seen this issue, and I filed a bug with Adobe, I do not know if Adobe recognizes this issue, or plans to address it in the future. Only time will tell.

The second issue is that there is no support for CS5 updates; AAMME provides no way to package these updates for separate deployment, nor to "slip-stream" them into an



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initial product deployment. Adobe plans to address this issue in some future release of the AAMEE tool.

A third issue is there is no support for Adobe Acrobat. Adobe Acrobat Pro 9 is not included as part of the CS5 install media; if the specific suite includes Acrobat Pro, it is distributed as separate media. AAMEE cannot build installer packages from the Acrobat Pro media. Administrators are essentially "on their own" when it comes to finding ways to deploy this application. This may be addressed with the release of Adobe Acrobat Pro 10, but that's of little help currently.

The last issue is the most serious. AAMEE-generated packages will fail to install if there is no user logged in at the GUI. In mass deployment, it is actually preferable to install software when there is no user logged in. You can schedule the install to happen automatically overnight, and you don't have to worry about the install affecting the user, or the user affecting the install. But AAMEE-generated packages fail if no user is logged in.

Fortunately, Adobe agrees that this last issue is a serious one. It is the reason that the June 2010 release of Adobe Application Manager, Enterprise Edition is a "Preview". As of this writing, Adobe has announced that an update will be available in early July to address this issue.

Conclusion

Adobe Application Manager, Enterprise Edition shows promise. It represents a useful step forward for enterprise deployments, and eventually should allow administrators to use a wider array of tools to deploy Adobe CS5 applications across an enterprise environment. Unfortunately, the current release of AAMEE suffers from a variety of issues, the worst of which prevent real-world use of packages it creates in many circumstances.

Enterprise administrators should continue providing Adobe with feedback on AAMEE and other related installation issues, including CS5 updates and Adobe Acrobat Pro. Adobe is making slow steps toward enterprise-friendly installers. Hopefully we can continue to guide Adobe toward a robust, flexible solution that meets the needs of the enterprise.

MT

About The Author

Greg Neagle is a member of the steering committee of the Mac OS X Enterprise Project (macenterprise.org) and is a senior systems engineer at a large animation studio. Greg has been working with the Mac since 1984, and with OS X since its release. He can be reached at gregneagle@mac.com.

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Mind Mapping

Making your point visually

by Shelley A. Watson

Introduction

This article stems from my own experiences working as an Apple consultant in my own practice for many years. I was delighted to come upon mind maps as a tool, as they have proved to be a powerful, effective method of communication. I know from my own experience that communicating complex technical information and decision points can be a real sticking point for consultants and IT staff, which led me to both explore using mind maps, and then to write about the experience. In our consulting practice, we have begin to use mind maps not just for customer facing communication, but also in our strategic planning process. Unlike more technical tools, mind maps by their nature invite whole-brain thinking, exploration, and mental freedom to roam. I hope this article will intrigue readers enough to explore the myriad uses for mind maps.

The Challenge

As a technical professional, one of the challenges I routinely face is communicating technical information to non-technical decision makers in a manner that all parties can understand and trust. Often, we as technical professionals don't control the purse strings, and have to convince either clients or internal stakeholders and decision makers that our recommendations are worth the dollars we want them to spend.

We have two major hurdles to overcome. First, technical information is often complex, multi-layered and non-intuitive, making it difficult to communicate to a non-technical audience. IT explanations can sound like a foreign language. No matter how passionate we are about a great solution, if the listener goes blank, we haven't generated understanding, let alone excitement. Second, non-technical partners can arrive at the table with a lack of trust in technical opinions, based on a lack of understanding, poor past experiences, or both. Technical professionals need the assent and support of non-technical partners in order to implement quality solutions that benefit all parties. Non-technical decision makers and stakeholders can't be expected to take opinions and recommendations carte blanche from the geeks. Rather, it is the job of the technical professional to find a way to communicate technical information that engenders confidence, and that truly provides a conceptual understanding of the technical solution. We have found that presenting technical information visually, using mind maps, is one way to address this challenge.

What Is A Mind Map?

According to Wikipedia, "a mind map is a diagram used to represent words, ideas, tasks, or other items linked to and arranged around a central key word or idea. Mind maps are used to generate, visualize, structure, and classify ideas, and as an aid in study, organization, problem solving, decision making, and writing." Generally, mind maps have a tree structure, or a radial, nonlinear structure, reflecting a free ranging thought process. Mind maps have a single central concept, from which the related points branch off. Sometimes they branch, sometimes they arrange into areas of related concepts. In either case, the mind map is illustrative, and can free the concepts from the typically linear, hierarchical box used in presentation. One of the most powerful elements in using mind maps has been the ability to use color, shading, and other visual forms of emphasis and contrast.

The concept of presenting information visually has been around for centuries, according to various sources, including the illustration of Aristotle's ideas by Porphyry in the third century. Mind mapping resurged in use in the 1970's as a brainstorming technique, but it has found its way into education, engineering and planning disciplines. There have been attempts to the credit for the invention of the idea, notably by the British pop psychologist Tony Buzan, who holds the trademark in the U.K. and the U.S. According to the website www.mindmapper.com, the credit for the development of modern mind mapping belongs to Dr. Allan Collins, by virtue of his research and published works on the topic. All credit aside, the concept is a powerful one that continues its long history of illuminating the human thought process.

Excellent sites for information on mind maps, including examples, and software, include Tony Buzan's website, www.thinkbuzan.com/uk, www.novamind.com and the mindmapper.com website listed above. There are also several blogs that attempt to corral information and resources about

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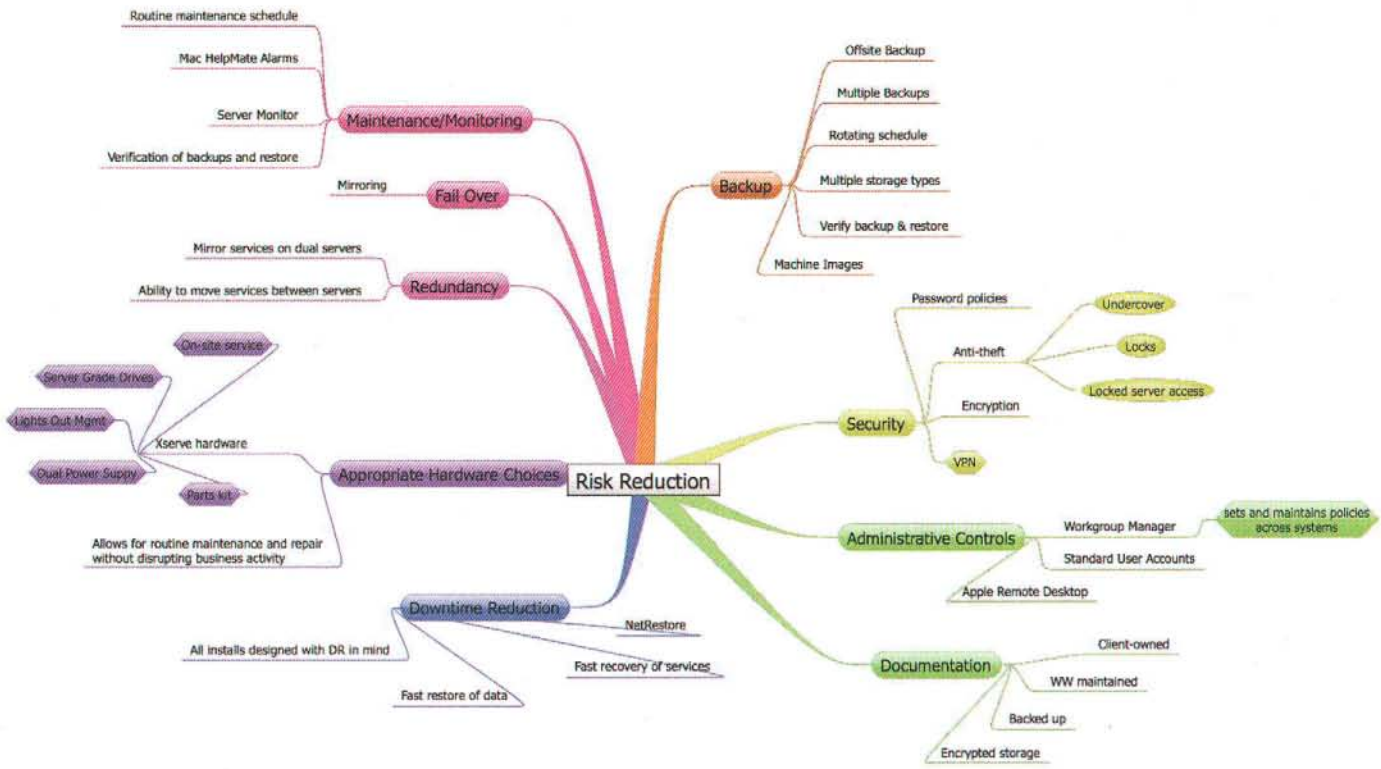

Figure 1. Risk Reduction Mind Map

mind maps into a central site, including www.mindmapping.typepad.com, and www.themind-mapper.wordpress.com. We use the NovaMind software for creating our mind maps, which we discovered through our association with the Apple Consultants Network.

Illustrating a single, complex idea

One of my first attempts at a mind map came from the desire to communicate to customers the multifaceted notion of risk reduction. In a business setting, there are so many components to reducing overall risk that a bulleted list neither does them justice, nor groups the ideas effectively. The mind map certainly did a good job of illustrating the many components, down to a finer grained level of detail, while keeping the overall concept central. But the real bonus was that as I brain dumped the information, doing so with a mind map made the process much easier. It felt creative, and it went very quickly. Refining the information was easy, since using a mind map is well suited to the way one's mind jumps around between topics. Rather than getting sidetracked by ideas coming up randomly, the mind map provided a framework for capturing the stray bits and knitting them into a whole.

Guide The Planning Process

Mind maps can also come into play during a planning process; particularly one where the existing infrastructure is either in a disorganized state, or not understood very well. If a customer doesn't have a clear grasp of their existing structure, it can be difficult to gain agreement on needed improvements without clarification. A facility where equipment is scattered, and documentation out of date can compound the difficulty. A recent example of this was a non-profit with a mixed Mac and PC architecture. Explaining how the scattered servers and services would integrate with the recommended upgrades was problematic. In this case, a mind map with the existing and recommended servers listed helped bring order to our recommendations.

This situation also presented unusual challenges in communicating with the variety of stakeholders. The internal IT staff needed help bringing order to the different parts of the system. His manager, the non-technical decision maker, needed to be able to understand what was being recommended, since she in turn was responsible for selling it to the even less technical Board of Directors for approval. As the IT consultants, we knew we only had access to the internal IT staff member, and limited access to his manager. We had to present the information in such a way that a) it was technically accurate; b) made sense to non-technical readers, and c) didn't require additional explanations.

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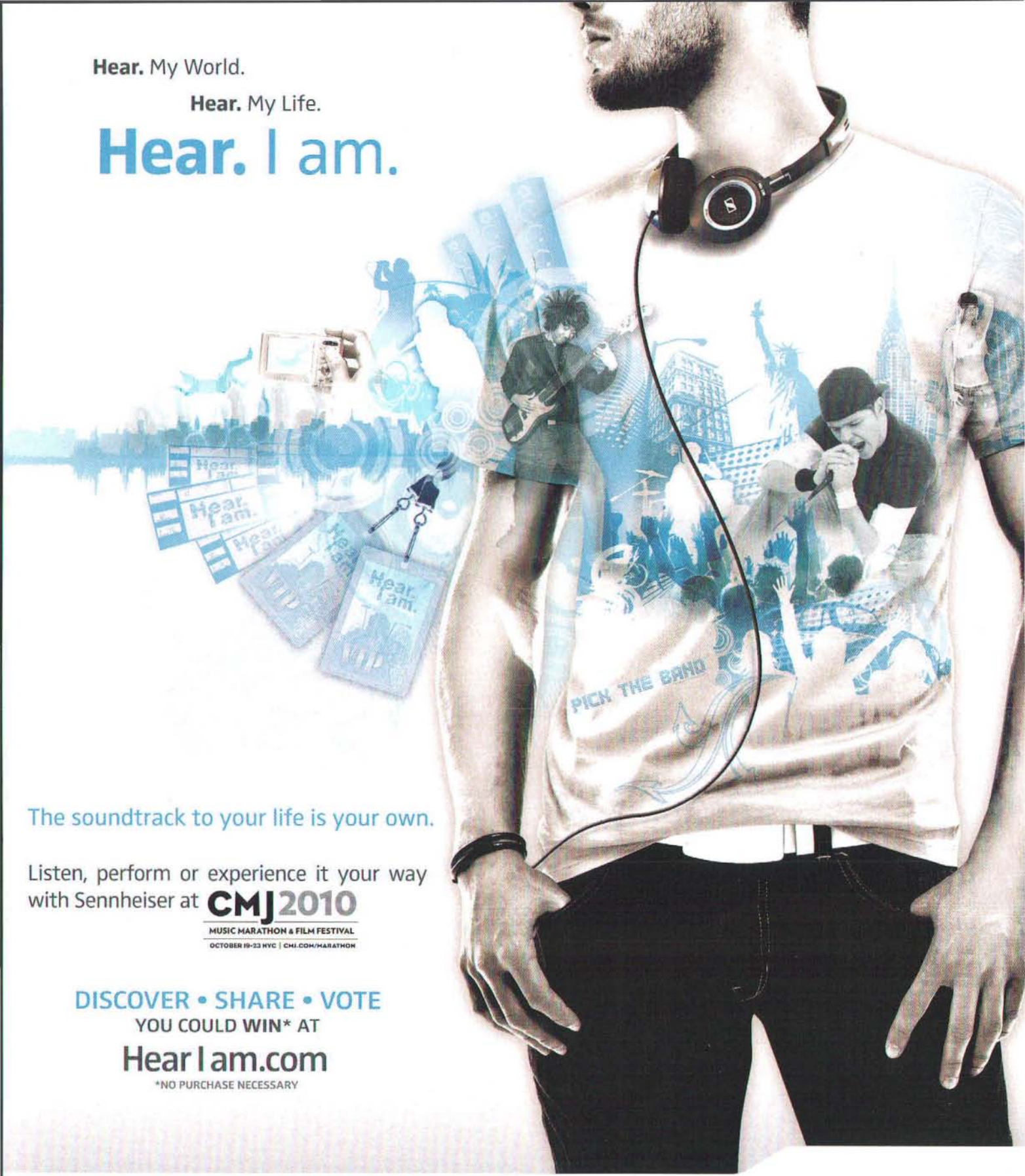
Hear. My Life.

Hear. I am.



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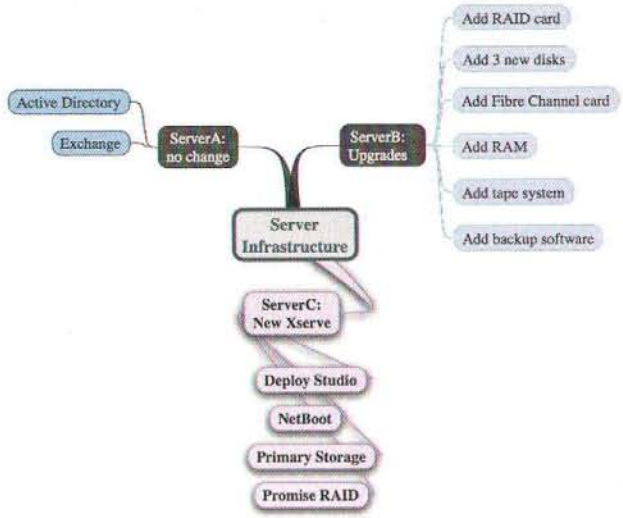

Figure 2. Planning Process Mind Map

Servers A & B are existing servers; one needs upgrading, the other can be left as is. Server C, shown in a different color for emphasis, will be purchased, and the services show added to the infrastructure. Color is used to both associate items (the two existing servers), and differentiate them (the new server and its services). The non-technical decision makers were able to grasp the recommendations easily; the internal IT staff was able to use this map as a tool to support their rationale and recommendations. Despite a tight budget, the board approved the upgrades and additional server. A clear, succinct map helped this project get approved and completed.

Selling The Implementation

We recently had a customer who was finally buying off on a much-needed hardware upgrade. We'd been talking to them about this project for nearly two years, and they had grudgingly agreed to upgrade to a dual Xserve model from a single tower server. However, talks broke down at their suggestion that they upgrade the tower, and delay the second Xserve purchase for maybe 6 months. Our assertion that the cost was greater flew in the face of their sense that upgrading tower would save money. On the face of it, upgrading seems logical, right? You keep the equipment going as long as you can and then buy the second server only when you need to. Customers are already so worn out with the three to four year replacement cycle that they yearn to find ways to make equipment last longer. But when we considered the project from a technical planning standpoint, it was actually cheaper in person-hours to configure the two servers side by side than it was to spend time on upgrading a box that's on its last legs and then have to craft a single server by itself in 3-6 months. We tried having this discussion in a meeting, but our technical talking points made the customer's eyes glaze over. We kept losing them to their belief that it was cheaper to fix up than replace. An Excel spreadsheet with numbers in tables for comparison didn't make the point. We needed another way to make our point, and fast.

NovaMind from NovaWorks came to the rescue. We had two timelines in the visual, one for the replacement and one for the repair

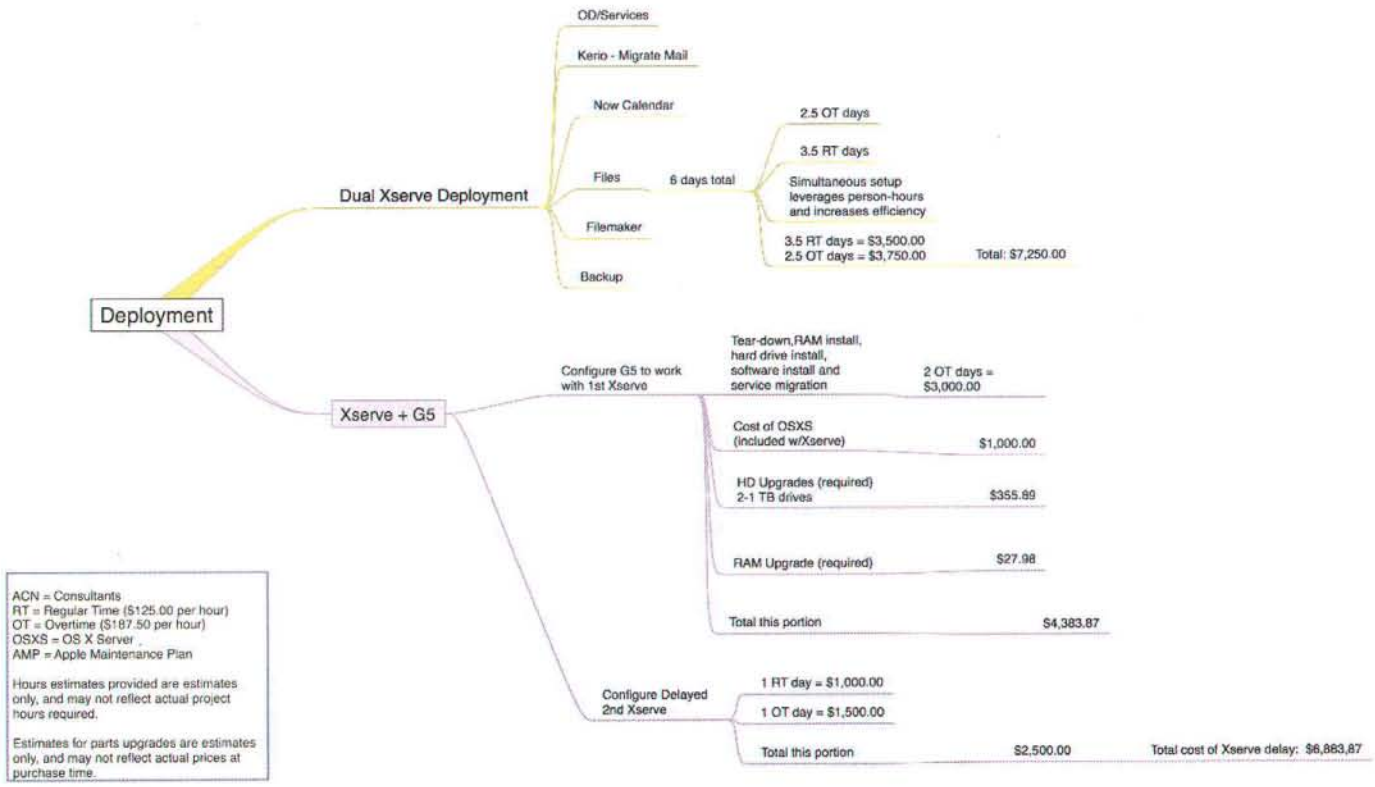

Figure 3. Deployment Process Mind Map

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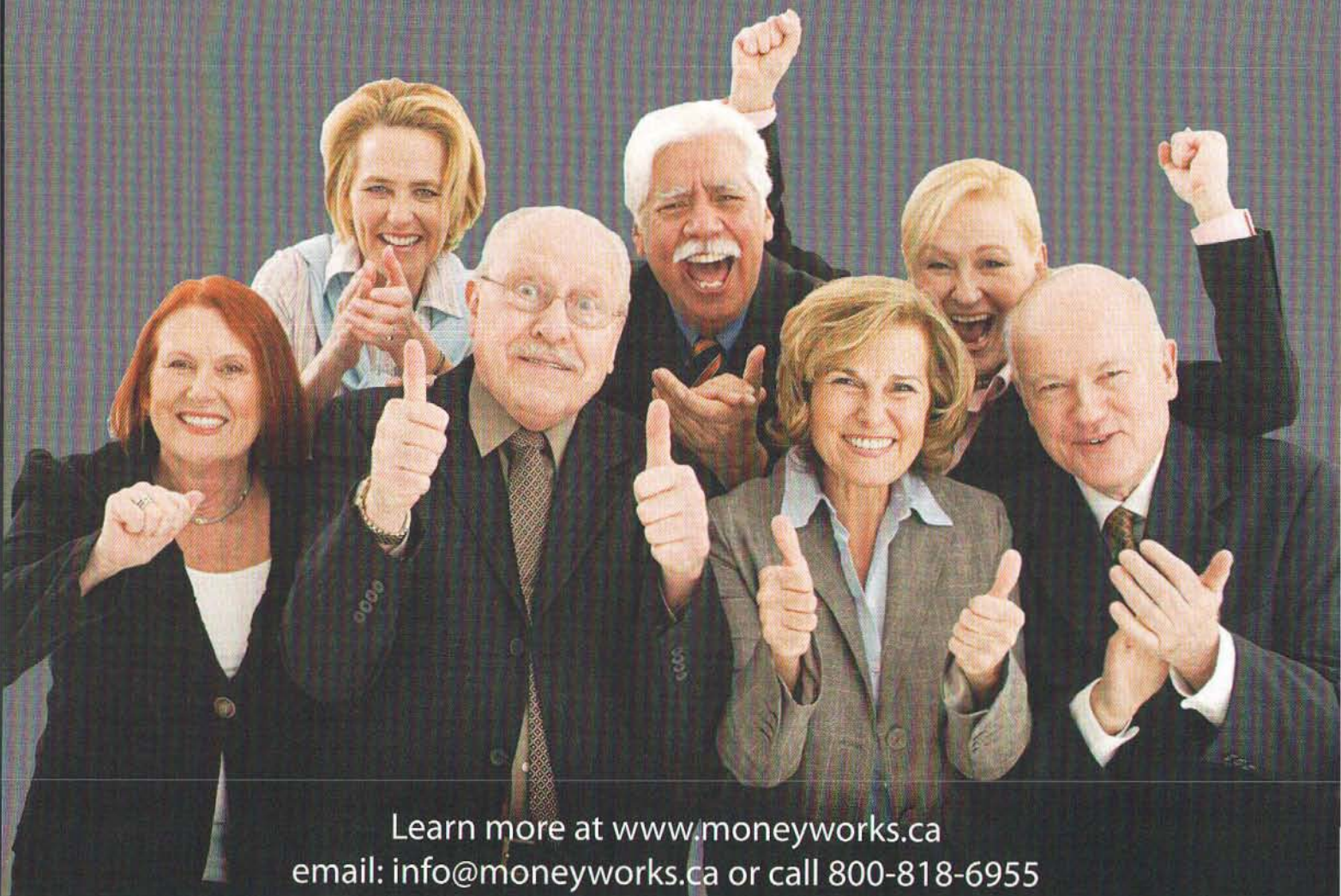

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plus eventual replacement. The project steps had estimates for the dual Xserve deployment vs. the delayed deployment for all implementation costs. Granted, it was nothing artistic, but the visual representation made more sense to the customer than anything else we had presented. Laid out visually, the customer could see the longer timeline, incurring more consulting costs. You can see from the diagram that although the cost of the Xserve + G5 option has a lower total number, that total is labeled as the delay's cost, since it does not include the deployment of the first Xserve. The greater number of additional steps were clearly illustrated in the mind map, along with the relatively fewer steps in the dual deployment. The customer took one look at the visual and bought off on the dual Xserve deployment. The mind map, with its visual display of the additional steps and labor costs involved, got the point across surprisingly better than our traditional cost spreadsheet.

Using NovaMind

One feature I particularly like about NovaMind is the presentation tool built into the software. Rather than converting the mind map to a presentation slide deck, and adding transitional effects manually, NovaMind has a presentation mode that animates the display of the concepts and their branches. For example, in the risk reduction mind map, I can set the animations to show first the core concept, then the first level child concepts. Next, the software zooms the display to focus on one of the child concepts, then its branches. This feature makes turning a mind map into a presentation as simple as possible.

NovaMind provides a great deal of free training on their product, including a 14-day Power Mind Mapping video course. It consists of 14 lessons over 28 days, each with an introduction to the topic, and link to watch the course video online. NovaMind also provides many examples of mind maps, most of which include graphics and other visual tools not included in my samples.

Conclusion

We have found in the last year that when we have challenges communicating with customers, mind maps are on our list of tools to overcome the gaps in understanding. Our past success with the visual style of the mind map has shown us its efficacy in communicating to non-technical partners. Rather than the traditional "reading left to right" linear method, a mind map allows the viewer's brain to see everything at once, and grasp concepts shown with visual emphasis like color, contrast, graphics and relative size. A well-thought out, well-crafted mind map can go a long way to overcoming traditional barriers in communication between technical and non-technical partners.

About The Author

Shelley Watson has been a Macintosh consultant and trainer for 15 years. She is on a quest to answer the eternal question, "What's for dinner?". She can be reached at shelley@wheelwrights-llc.com.

When and Where?

MacTech Conference for IT Pros and Apple developers is November 3-5, 2010, in Los Angeles at the Sheraton Universal in Universal City. The three-day, packed event will have sessions and activities throughout the day and evening giving attendees the opportunity to not only learn from the best, but to also get to know others in the industry.

Two Session Tracks.

The MacTech Conference will have two separate tracks: one focused on IT, and one focused on programming/development. Sessions will focus on both desktop and mobile, with appropriate levels of attention paid to the Mac, iPhone, iPad and iPod.

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Space is Limited.

We have a limited number of conference attendee spots and hotel rooms available. As a conference with hundreds, not thousands, of people, we want you to have time to get to know people. But, that also means that (like other conferences in the Apple market) if you don't act fast, you may miss out.

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NSConference 2010

A summary of this year's NSConference

by Dave Dribin

What is NSConference?

NSConference is a multi-day conference put on by the venerable Steve "Scotty" Scott of the Mac Developer Network. Scotty does a lot of wonderful things for the Mac and iPhone developer community, including his podcast, the *MDN Show*. In 2009, he decided to branch out into putting on his own conference. This first year, the conference took place only in the United Kingdom. For 2010, Scotty expanded the conference to the United States and put on the conference in both the UK and US. In interest of full disclosure, I was a speaker at this year's conference.

The Structure

There were three days of sessions and one day of longer training workshops. The three session days were broken down into two days of Mac-related sessions and one day of iPhone-related sessions. As with most Mac and iPhone-related topics, however, there was a lot of crossover between the two types. For example, my talk was on clean code was part of the Mac sessions, but pertained equally well to iPhone programmers (at least I hope it did).

The sessions at the UK and US versions were generally the same. There were minor differences due to scheduling conflicts, and the speakers were free to change up their presentation slightly. I've included a list of all the sessions at the end of this article. The full-day workshops were classes concentrating on a single topic. The topics were generally quite technical in nature. Some were about specific APIs or technology, along the lines of presentations you might expect at Apple's WWDC. Others were topics that you would never see at an Apple sanctioned conference, and still others were more abstract in nature.

I was lucky enough to be invited to speak at this year's conference, which means I got to attend both the UK and US versions. The UK version was held in Reading, not too far from London, and the US version was held near downtown Atlanta, Georgia on the Georgia Tech campus. The UK version had the day-long workshops first, followed by the Mac and iPhone sessions while the US version had the day-long workshops after the other sessions.

Each session was about an hour long with about thirty minutes between sessions. The long breaks between sessions were nice because it allowed for socializing with other attendees. While the technical content of the sessions is no doubt the focal point, the social aspects of conferences like WWDC have been of great value to me. I was glad that Scotty recognized this and incorporated it as a core part of NSConference.

The Sessions

I'm not going to give opinions on any of the other sessions, as that would be a little awkward, given that I was a speaker. I can, however give a brief overview of my talk and then list all the presentations. The video of all sessions are available for purchase on the NSConference website. The video for the workshops are not yet available.

My Clean Code Session

My presentation was titled "Clean Code" and while technical, was not about any specific APIs or technology. Writing clean code is very important for real-world projects, in my opinion. While it is important for an application to function properly, it is only part of the problem we programmers face in day-to-day coding. Clean code, to me, is about the quality of the code itself. The quality of the code plays a huge role in how fast new features can be added or bugs can be fixed. Anyone who has been programming for more than a few years knows that spaghetti code is much harder to understand, and hence, to extend or modify.

The core of clean code, to me, is about readability and understandability. The compiler doesn't care how well the code is written or what language it was written in. Thus code should be written with other programmers as a prime audience. A quote I used from the Abelson and Sussman textbook, *Structure and Interpretation of Computer Programs* adequately describes how I feel about this:

"Programs must be written for people to read and only incidentally for machines to execute."

I gave some specific tips on what clean code is and how to recognize it, such as the Don't Repeat Yourself or DRY principle along with the advantages of small classes and methods. I went over a few "before and after" examples of how shortening methods to about fifteen lines of can drastically help readability. I also discussed the differences between the main techniques to reduce coupling between different layers of the application: delegates, notifications, and key-value observing. If you want to hear more about these topics, along with why I think the singleton design pattern is almost always a design smell and should be avoided, download the full video, complete with some good Q&A.

List of All Sessions

Here is a full list of all the sessions. Remember that if you find any of these interesting, you can purchase videos of many of these on the NSConference website.

"Engineering Life" - Mike Lee

"Spelunking OS X" - Jonathan "Wolf" Rentzsch

"Clean Code" - Dave Dribin

"Signing Your Apps" - Graham Lee

"Data Presentation in Mac Apps" - Drew McCormack

"Core Animation" - Marcus Zarra

"Cocoa Design Patterns that Leverage the Objective-C Runtime" - Jeff LaMarche

"Brushing Up on Open CL" - Andy Finnell

"Meet the User" - Mike Lee

"Hard and Fast OpenGL ES" - Jeff LaMarche

"Core Data Synchronization with ZSync" - Marcus Zarra

"The Physics of Sumo" - Drew McCormack

"Supporting Online Play and GameKit in Your Application" - Jeff LaMarche

"The Many Faces of Data Persistence" - Aaron Hillegass

About The Author

Dave Dribin has been writing professional software for over eleven years. After five years programming embedded C in the telecom industry and a brief stint riding the Internet bubble, he decided to venture out on his own. Since 2001, he has been providing independent consulting services, and in 2006, he founded Bit Maki, Inc. Find out more at <http://www.bitmaki.com/> and <http://www.dribin.org/dave/>.

A Dashboard Widget that Supports Copy-and-Paste.

How to implement Copy-and-Paste in Dashboard.

By Mihalis Tsoukalos

Introduction

This article will expand on concepts presented in previous MacTech articles focusing on Widget creation. This time, the focus is on adding copy and paste functionality to a Widget.

The technique is relatively easy, so, let's jump in.

The files that compose the CaP Widget

Figure 1 shows the files of the Widget as well as their sizes (in bytes).

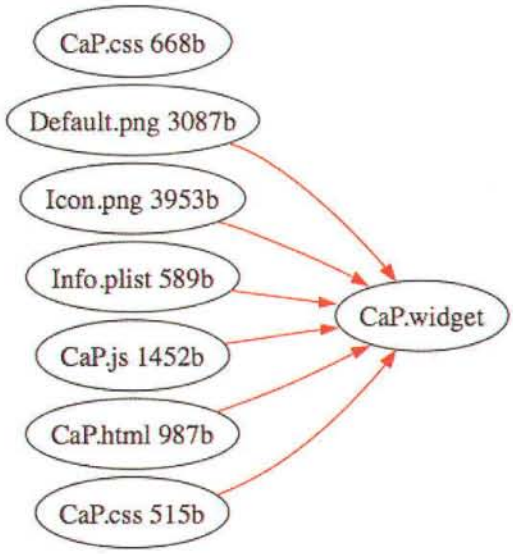

Figure 1: The files that compose the CaP Dashboard Widget.

As you can see by looking at Figure 1, the presented Widget is relatively uncomplicated.

Figure it out

In case you are wondering how I made Figure 1, I should say that I used GraphViz. While there are a number of tools that run in the Mac OS X GUI to create graphs, GraphViz uses a descriptive language. This makes tweaking, recreating and storing graphs very easy. The following GraphViz code created Figure 1:

```
digraph Widget
{
    graph [size="16.6", nodesep="0.05", rankdir=LR];
    node [label="\N"];
    edge [color=red, len=2];
    graph [bb="0.0.258.236"];
    "Default.png 3087b" -> "CaP.widget";
    "Icon.png 3953b" -> "CaP.widget";
    "Info.plist 589b" -> "CaP.widget";
    "CaP.css 668b" -> "CaP.widget";
    "CaP.js 1452b" -> "CaP.widget";
    "CaP.html 987b" -> "CaP.widget";
}
```

The Code

The code is the key, of course, so let's make that our first stop, and follow with a discussion. All code can be downloaded from the MacTech ftp site at ftp://ftp.mactech.com. The contents of the HTML file are as follows:

Listing 1: CaP.html

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
      "http://www.w3.org/TR/xhtml1/DTD/xhtml1-
transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml">

<head>
<meta http-equiv="Content-Type" content="text/html;
charset=ISO-8859-1" />

<!- The CSS file for this widget ->
```

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```
<!- This is a very simple CSS file ->
<style type="text/css">
    @import "CaP.css";
</style>

<!- The JavaScript code for this Widget ->
<script type='text/javascript' src='CaP.js' charset='utf-8'/>

</head>

    <body oncut='cutIT(event);' oncopy='copyIT(event);'
onpaste='pasteIT(event);'
            ondragenter='dragenter(event);'
ondragover='dragover(event);'
            ondrop='dragdrop(event);'
ondragleave='dragleave(event);'>

    <img src="Default.png" >

    <div class="Data">

        <div class="PATHoutput">
            <div id="myText">Drop the file or the directory
HERE!</div>
            <div id="PATH"></div>
        </div>

    </div>
</body>
</html>
```

The CSS file contains the following code:

Listing 2: CaP.css

```
body
{
        margin: 0;
}

#myText
{
        font-weight: bold;
        color: white;
        padding-top: 4px;
        padding-bottom: 2px;
        text-align: center;
        -apple-dashboard-region: dashboard-region(control
rectangle);
}

#PATH
{
        font: 12px "Lucida Grande";
        font-weight: bold;
        color: white;
        word-wrap: break-word;
        padding-top: 2px;
        padding-bottom: 4px;
        -apple-dashboard-region: dashboard-region(control
rectangle);
        -khtml-user-select:text;
}

.Data
{
        opacity: 1.0;
        position: absolute;
        top: 30px;
        left: 15px;
}

.PATHoutput
```

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**Proximity Sync feature not yet available for The Missing Sync for Windows Mobile.

```
{
        color: grey;
        padding-right: 8px;
        padding-left: 8px;
        width: 140px;
}
```

Although the CSS file looks trivial, it has a subtle point. Without the "**-khtml-user-select:text;**" command, you will not be able to select the text or part of it. Also, it is important to include the "**-apple-dashboard-region: dashboard-region(control rectangle);**" CSS command.

What the last command does is to inform Dashboard that the *#PATH* and *#myText* areas cannot be used as handles that move the Widget around Dashboard by clicking it and dragging it around. This allows us to select text from the Widget.

The Javascript Code

The JavaScript code that is needed for the Widget to operate as expected is shown in Listing 3.

Listing 3: CaP.js

```
function dragdrop (event)
{
    var uri = null;
    try {
        uri = event.dataTransfer.getData("text/uri-list");
    } catch (ex)
    {
    }

    // if the acquisition is successful:
    if (uri)
    {
        // Write some text to the output
        document.getElementById("myText").innerText = "The full
path is:";
        // And display the file's URL
        document.getElementById("PATH").innerText = uri;
    }

    event.stopPropagation();
    event.preventDefault();
}

// Although the following events are not supported
// their handlers must be present and do nothing.
function dragenter(event)
{
    event.stopPropagation();
    event.preventDefault();
}

function dragover(event)
{
    event.stopPropagation();
    event.preventDefault();
}

function dragleave(event)
{
    event.stopPropagation();
    event.preventDefault();
}

// For the Copy Paste implementation
function cutIT(event)
{
    event.preventDefault();
```

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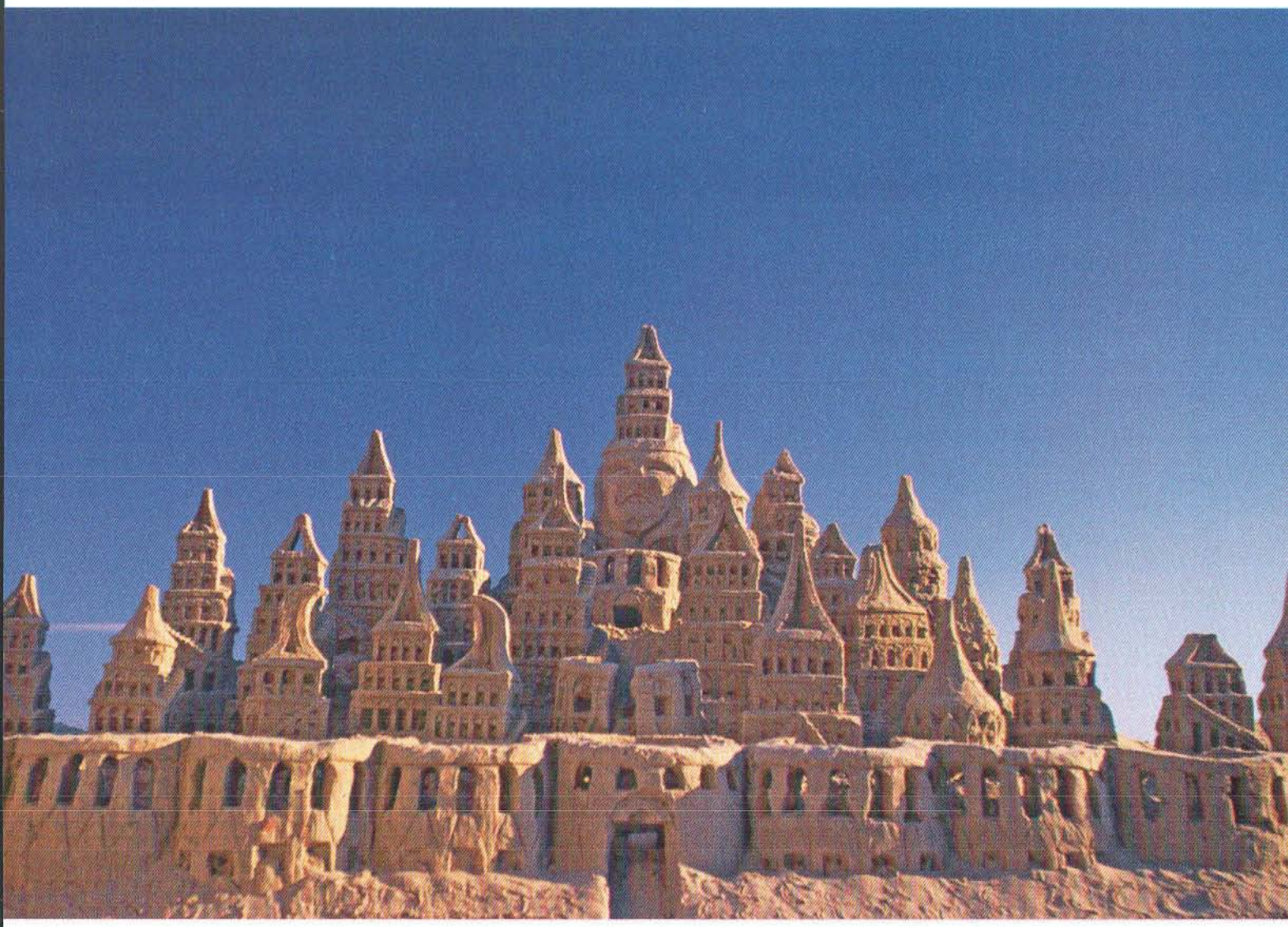

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```
    event.stopPropagation();
}

// * * *
// * * * This Widget only supports copy events
// * * *
function copyIT(event)
{
    event.clipboardData.setData('text/plain',
document.getElementById("PATH").innerText);
    event.stopPropagation();
    event.preventDefault();
}

function pasteIT(event)
{
    event.stopPropagation();
    event.preventDefault();
}
```

The Info.plist file

The Info.plist file for the Widget has the XML code shown in Listing 4.

Listing 4: Info.plist

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN"
        "http://www.apple.com/DTDs/PropertyList-1.0.dtd">

<plist version="1.0">
<dict>
    <key>AllowFileAccessOutsideOfWidget</key>
    <true/>
    <key>CFBundleDisplayName</key>
    <string>CaP</string>
    <key>CFBundleIdentifier</key>
    <string>com.mtsouk.widget.CaP</string>
    <key>CFBundleName</key>
    <string>Copy and Paste Widget</string>
    <key>CFBundleShortVersionString</key>
    <string>1.0</string>
    <key>CFBundleVersion</key>
    <string>1.1</string>
    <key>MainHTML</key>
    <string>CaP.html</string>
</dict>
</plist>
```

Explaining the technique

The most critical part of the Widget is the following HTML code from the *CaP.html* file:

```
<body oncut='cutIT(event);' oncopy='copyIT(event);'
onpaste='pasteIT(event);' ondragenter='dragenter(event);'
ondragover='dragover(event);' ondrop='dragdrop(event);'
ondragleave='dragleave(event);'>
```

If you haven't seen this pattern before, the above code states the way that the events will be handled. Their implementation must be in JavaScript, and is therefore included in the *CaP.js* file.

The following lines of code found in the *CaP.js* file implement the *copyIT(event)* function that does the actual copying of the file or directory path to the clipboard:

```
function copyIT(event)
{
    event.clipboardData.setData('text/plain',
document.getElementById("PATH").innerText);
    event.stopPropagation();
    event.preventDefault();
}
```

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With this code implemented, you can use the text either in Dashboard, or from another Mac OS X application. The *cutIT(event)* and *pasteIT(event)* JavaScript functions are similar to the *dragover(event)* function from the Drag-And-Drop technique explained in a previous MacTech article.

The list belowis comprised of the names of the six JavaScript events that are related to Copy and Paste in Dashboard. The CaP Widget only implements **oncut**, **onpaste** and **oncopy** events. The **onbeforecut**, **onbeforecopy**, and **onbeforepaste** events can be used if you want to process the data before the actual cut, copy or paste operation.

JavaScript Copy and Paste event name

onbeforecut

oncut

onbeforecopy

oncopy

onbeforepaste

onpaste

Also note that Apple states that for security purposes, **the *getData* method can be called only from within the *onpaste* event handler**. The *getData* method is not used in theWidget code presented here.

Conclusions

This article complements a previous article on Widget Drag-And-Drop. The presented technique is useful, yet simple and gives an expert tone to your Dashboard Widgets.

Bibliography and References

Dashboard sample code (from Apple developer site):
http://developer.apple.com/samplecode/AppleApplications/idxDashboard-date.html

Apple Dashboard Page:
http://developer.apple.com/appleapplications/dashboard/

Debugging Dashboard Widgets (from Apple developer site):
http://developer.apple.com/technotes/tn2005/tn2139.html

"Programming Dashboard Widgets" eBook by Mihalis Tsoukalos. You can find more information about the book at http://widgetbook.blogspot.com/. You can buy it at: http://store.kagi.com/cgi-bin/store.cgi?storeID=6FFME_UVE

GraphViz: http://www.graphviz.org/

Mac OS X edition of GraphViz:
http://www.pixelglow.com/graphviz/

About The Author

Mihalis Tsoukalos lives in Greece with his wife Eugenia and enjoys digital photography and writing articles. He is the author of the "Programming Dashboard Widgets" eBook. You can reach him at tsoukalos@sch.gr.

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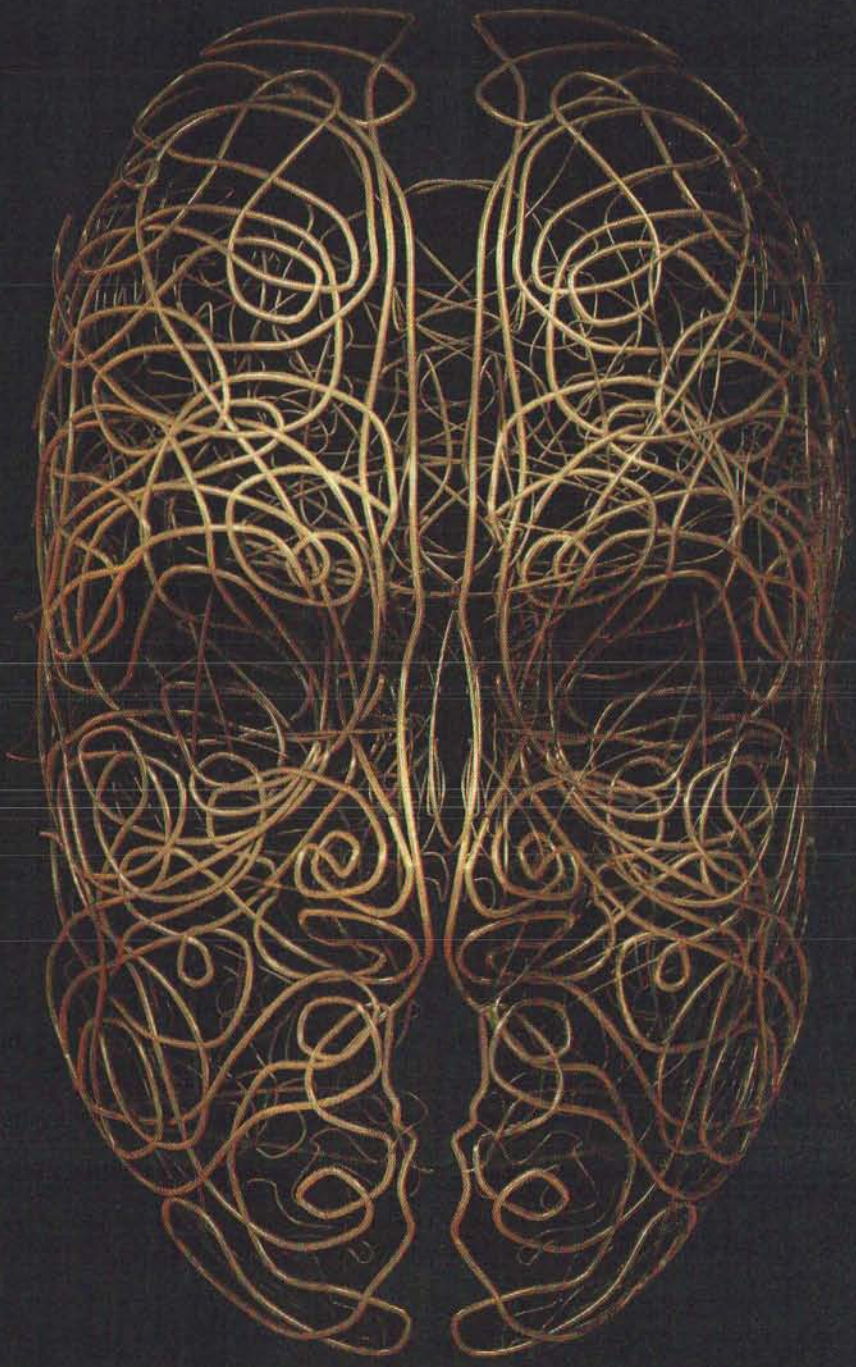

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Authoring Daemons in Mac OS X

A framework for writing and deploying background processes easily

by Boisy G. Pitre

Introduction

For many Mac developers, writing applications involves the management of data through the prism of a graphical user interface. The expectation is that the user, in creating or manipulating the data, will need to interact with the computer in order to achieve certain objectives like formatting a document with a word processor, or edit an image with a photo editor. Yet, there are times when the scope of a task is simple and direct enough to forego the use of any user interface at all; in fact, it may even be undesirable and distracting to do so. Such tasks are often relegated to running in the background, quietly doing their work and contributing to some aspect of the overall system with no user intervention.

Such a background process has been traditionally used in Unix and Unix-like operating systems, and is commonly known as a *daemon* (pronounced *dee*-muhn). The name itself harkens back to the invisible spirits of Greek mythology who acted as guardians or guides, and in a very real sense, this can be applied to our notion of what the daemon embodies. Much like its mythological counterpart, the modern day daemon lives in a somewhat invisible plateau of the system, performing important tasks and doing work "behind the scenes."

In this article, we will explore the motivation for writing a daemon, examine the necessary development and environmental considerations, learn how to debug these faceless entities, and lastly, how to deploy them in the context of Mac OS X's background framework.

Why Write a Daemon?

It should be noted up-front that daemons are a best-fit solution for a narrow class of applications. When evaluating a program to see if it is suitable for the daemon model, compare your requirements to the following. If a daemon is the right approach for your program, then all of these criteria will apply. While these may not be the only criteria for writing a daemon, they are certainly cardinal pillars of "daemonology."

The application does not require any user interaction or visual feedback to function

There is a level of redundancy to the task or tasks that the application must perform

The application does its work ad infinitum (i.e. there is no defined termination point)

In the Unix tradition, daemons have been the basis of programs that ascribe to the client/server architecture. In this case, the daemon serves up tasks to handle incoming connections from other computers via networks, and the daemon has what can be described as "multiple personality disorder." That is, the singular daemon binary acts as both a connection listener and data servicer by using the Unix `fork()/exec()` functions, which allow a process to spawn itself into another running process.

This split personality concept is not too dissimilar from the process of cell division that we learned back in our high school biology class. The spawned process executes in such a way that a different code path is executed and the spawned process services the client on a private port number (see Richard W. Stephens' *Advanced Programming in the Unix Environment* for a solid treatise on writing daemons of this sort.) While such a style of daemon can still be written in OS X, Apple has wisely built the listener responsibility of the daemon into a program called `launchd`, which we will discuss next.

How Daemons Come And Go

Daemons have been around since the start of OS X. However, starting with Mac OS X 10.4, Apple introduced the `launchd` program. This tool is responsible for, among other things, launching and stopping daemons and agents (agents are

similar to daemons but are run on a per-user basis). As the primary process in the system (it has a process ID of 1), it comes up early on in the boot process. Once started, it looks in several predetermined folders on the file system for plist (property list) files that contain information on the daemons and agents that exist.

For non-Apple third-party daemons, such as the one we are creating, the plist files are located in `/Library/LaunchDaemons`.

Note: `/System/Library/LaunchDaemons` is reserved for Apple's use only, and may be modified by system updates, so, don't touch that location). The `launchd` process dutifully goes through each plist file in this folder and inspects it. If the plist criteria specifies that all launch conditions are met, then `launchd` will spawn the daemon associated with that plist file.

For interfacing with `launchd`, Apple provides a command-line utility called `launchctl` that can be used to stop, start, load and unload daemons and their property list files. For system-wide Launch Agents, the `launchctl` utility should be run as root (via the `sudo` command). More about this utility and the `launchd` process can be found at http://developer.apple.com/macosx/launchd.html

Another common way to communicate to a daemon is through signals; an interprocess communication mechanism that is analogous to an interrupt. A signal is essentially a numerical value that can be sent from another program. The `SIGTERM` signal is the traditional signal that processes, including daemons, are sent when they are requested to shut down, and can easily be sent to a process with the command: `sudo kill -TERM` *p* where *p* is the process id of the recipient.

Environmental Considerations

When contemplating development of a daemon, we must consider the environment in which it will be living and working. Daemons are somewhat unique in that they typically run as the root user, or super user, and do so outside of the purview of what we normally think of as the "usable system." In fact, most daemons come alive and are run even before the login window appears on your Mac; furthermore, they continue to run even after you log out. This scope allows a daemon to perform work when there is no user activity on the system, which can be an advantage. It also means that, as root processes, daemons have access to certain areas of the file system (and certain system calls) that are not privy to regular users (at least not without some form of authentication). As such, daemons must be careful when removing files or folders, or marshaling system resources such as memory or processor time.

This leads us to another significant consideration that must be given to daemon development: the intensity of the work that it will be required to do. Since a daemon runs in the background, it cannot be "seen" in the normal context that we see other applications run. A daemon has no dock icon. It has no window, and there are no visual cues that it even exists. Many everyday users don't even know that these processes are running in the background, quietly doing their work. As such, daemons have a particular responsibility for being efficient and fair in terms of processor utilization and other system resources (although launchd itself can limit the impact of daemons).

Most of a daemon's life is spent sitting idle, waiting for some outside event to wake it up and give it something to do. This can be an incoming network connection or a timer which periodically nudges it to do something useful. When it is time to do the required work, the daemon should be as efficient and quick as possible in carrying out its task. Careless or thoughtless use of processor bandwidth can result in a degraded experience for users of the system.

One final consideration: Apple has carefully documented which of its frameworks are "daemon-safe" and which are not. Generally speaking, lower level frameworks like Foundation and Core Foundation are safe for use in daemons, while higher-level frameworks like AppKit are not. Apple's daemon documentation provides a list of safe and non-safe frameworks to use, so please consult this resource if you are unsure.

A Daemon Framework

In order to facilitate the development of daemons, we provide a framework of files and classes to quickly and easily get you started. For your convenience, the Xcode project is downloadable from the MacTech FTP source archive at ftp://ftp.mactech.com.

Listings 1 and 2 show `Daemon.h` and `Daemon.m`, which comprise the foundation of the daemon code. In the header file, a simple protocol is declared which advertises the `performWork` method, expected to be adopted by tasks in the daemon (more on that later). The .m file contains several functions including the venerable `main()`. In this function, we set up our obligatory autorelease pool, register to handle several signals, then allocate and initialize an instance of the `MyTask` class.

The static boolean variable `keepRunning` is initially set to `TRUE` and is used to keep the while loop running. Within that loop, the task's `performWork` method is called, followed by a call to running the run loop for `kRunLoopWaitTime` seconds (currently set to 1.0 second).

When the `keepRunning` is eventually set to `FALSE` due to receiving a `SIGTERM` signal, the loop will terminate, the task will be released, and the autorelease pool will be drained. At that point, the daemon has finished running and will then terminate.

The signal handler function at the top of the file honors the `SIGTERM` signal by setting the `keepRunning` flag to `FALSE`. When control returns back to the while loop in the `main()` function, the daemon will exit. You can extend this function to honor and respond to other signals as you see fit.

The real work happens in the `MyTask` class (Listings 3 and 4). This class conforms to the `DameonProtocol` protocol declared in `Daemon.h`, and has the standard `init/dealloc` methods, as well as the obligatory `performWork` method. It is

here, in this method, that the work for your particular application takes place.

Listing 5 contains the plist file, which is necessary for your daemon to be recognized and started by the launchd process. Several important settings in this file dictate the startup and running behavior of your daemon. The `KeepAlive` key is set to false, which means that if the Daemon quits, launchd will not restart it automatically. The `RunAtLoad` key is set to true, indicating that upon launchd starting up at power-up or reboot, it should start the daemon at that time. The `StandardErrorPath` and `StandardOutputPath` keys provide paths to a single file which holds the logging output for the daemon.

An important note about the plist file: it is crafted for Mac OS X 10.5 and later. If you are running OS X 10.4, you will need to replace the `KeepAlive` key with the `OnDemand` key. More details for this can be found in Apple's documentation on daemons (referenced in the bibliography section of this article).

Writing, Testing and Debugging Your Daemon

Once you've downloaded the Xcode project from the MacTech FTP source archive site, open the project in Xcode and navigate to the `MyTask.m` file. In the `performWork` method, you can add whatever code you can think of, from checking the number of processes on the system to obtaining data from a remote data logging device. This method is your entry point into your daemon, and you can extend it however you see fit.

If you wish to perform multi-threaded operations, you can spawn one or more `NSThread` objects in the `init` method, manage their work collectively in the `performWork` method, and tear down and destroy them in the `dealloc` method.

Debugging your daemon couldn't be simpler, and is very much the same as debugging any other application in Xcode. Simply perform a Debug build, set the breakpoints and start your debugging session. More than likely, your debugging efforts will be concentrated in your `MyTask` class and your custom `performWork` method, so set breakpoints there.

There is something important to consider when debugging a daemon. Remember, the daemon will run as a root process. Because of this, it is a good idea to debug the daemon in Xcode as root, too. Note that this is **not necessary** if your daemon is not accessing privileged calls or areas of the file system, but if you want to test your daemon in the environment that accurately reflects is rights and privileges, then debugging as root is a veritable method. A convenient set of steps for setting up the Xcode project to do this can be found at http://stackoverflow.com/questions/1033026/debugging-in-xcode-as-root

Deploying Your Daemon

Once your daemon has been tested and is deemed to be running correctly, where should it go? An appropriate location for storing your daemon is in a sub-folder off of the `/Library` folder of your boot volume. The provided Xcode project contains a Run Script build phase which will create a folder named `/Library/MyDaemon` and copy the daemon and a convenient uninstall script into that location. The script will also

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copy the `com.mycompany.mydaemon.plist` file into `/Library/LaunchDaemons` so that launchd will be able to locate and launch the daemon at startup. Finally, the script will call launchctl to load and start the daemon.

The entire building and installation of the daemon on your system can be done in one step. Launch the Terminal application, then change into the directory of the project and type:

```
sudo xcodebuild install
```

This will build the daemon and run the installation script. You should then be able to launch the Console application, navigate to the `/Library/Logs` folder and view the `MyDaemon.log` file to see the results of logging output.

Uninstalling the daemon is easy too. From the Terminal, type:

```
sudo /Library/MyDaemon/uninstall.sh
```

The uninstall script will stop and unload the daemon and remove all files related to the daemon, including the `/Library/MyDaemon` folder.

Summary

Remember, daemons are the quiet workers of the system, doing their tasks in perpetuity and (hopefully) without fail. As root level processes, they are afforded additional privileges which also come with great responsibilities. Your daemons should cooperate nicely with the system and avoid straining memory, processor and storage resources so that your users can have a great interactive experience on the desktop. Have fun, and feel free to send me feedback on this article and how you plan to put daemons to use in your projects. Au revoir!

Code Listings

Listing 1: Daemon.h

```
#import <Foundation/Foundation.h>

@protocol DaemonProtocol

- (void)performWork;

@end
```

Listing 2: Daemon.m

```
#import "MyTask.h"

// seconds runloop runs before performing work
#define kRunLoopWaitTime        1.0

// global run flag
BOOL    keepRunning = TRUE;

/*
 * Signal handler is responsible for catching signals
 */
void sigHandler(int signo)
{
    NSLog(@"sigHandler: Received signal %d", signo);

    switch (signo)
    {
        case SIGTERM:
            // The SIGTERM signal means we must quit.
            if (signo == SIGTERM)
```

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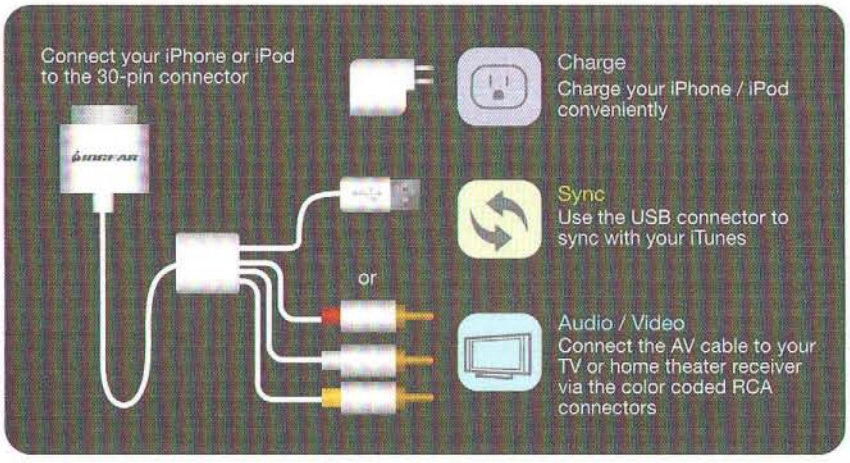

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```
            {
                keepRunning = FALSE;
            }
            break;

        default:
            // Other signals may be handled here as desired
            break;
    }
}

int main (int argc, const char * argv[])
{
    // Create an autorelease pool
    NSAutoreleasePool *pool = [NSAutoreleasePool new];

    NSLog (@"daemon running");

    // Register signals to be caught by our signal handler
    signal(SIGHUP, sigHandler);
    signal(SIGTERM, sigHandler);

    // initialize an instance of our daemon task
    MyTask *task = [MyTask new];

    // This is the main loop of the daemon
    while (keepRunning == TRUE)
    {
        [task performWork];
        CFRunLoopRunInMode(kCFRunLoopDefaultMode,
kRunLoopWaitTime, false);
    }

    [task release];
    [pool drain];

    NSLog (@"daemon exiting");

    return 0;
}
```

Listing 3: MyTask.h

```
#import "Daemon.h"

@interface MyTask : NSObject <DaemonProtocol>
{
}

- (id)init;
- (void)dealloc;
- (void)performWork;

@end
```

Listing 4: MyTask.m

```
#import "MyTask.h"

@implementation MyTask

/*
 * Initialization method: do here what needs to be done to
start things
 */
- (id)init;
{
    if ((self = [super init]))
    {
    }

    return self;
}

/*
 * Deallocation method: do here what needs to be done to
```

```
shut things down
 */
- (void)dealloc;
{
    [super dealloc];
}

/*
 * This method is called periodically to perform some
routine work
 */
- (void)performWork;
{
    NSLog(@"performing work...");
}

@end
```

Listing 5: com.mycompany.mydaemon.plist

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN"
"http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
        <key>KeepAlive</key>
        <false/>
        <key>Label</key>
        <string>com.mycompany.mydaemon</string>
        <key>ProgramArguments</key>
        <array>
                <string>/Library/MyDaemon/Daemon</string>
        </array>
        <key>RunAtLoad</key>
        <true/>
        <key>ServiceIPC</key>
        <false/>
        <key>StandardErrorPath</key>
        <string>/Library/Logs/MyDaemon.log</string>
        <key>StandardOutPath</key>
        <string>/Library/Logs/MyDaemon.log</string>
</dict>
</plist>
```

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About The Author

Boisy G. Pitre lives in Southwest Louisiana and is the lead developer at Tee-Boy where he also consults on Mac and iOS projects with a variety of clients. He holds a Master of Science in Computer Science from the University of Louisiana at Lafayette. Besides Mac programming, his hobbies and interests include retro-computing, ham radio, vending machine and arcade game restoration, and playing Cajun music. You can reach him at boisy@tee-boy.com.

Data Recovery Software

Bring it back!

by Dennis Sellers

If you're looking for data recovery software for your Mac, you have several good choices. Among them: Stellar Phoenix, REMO Recover (Mac), FileRecovery and Data Rescue.

Stellar Phoenix Macintosh Data Recovery

Stellar Phoenix is file repair software. However, it provides full preview support for recoverable files prior to restoration.

The software recovers lost/deleted data due to accidental deletion or formatting of HFS, HFS+, HFS Wrapper, and FAT file system volumes or corruption of the storage media. Stellar Phoenix Macintosh Data Recovery comes with a Boot DVD that can be used to boot the system if the file system crashes or the operating system doesn't load. Its interface has a Mac style find option (to search for a particular file) and an audio and video file preview using Apple's QuickTime Player.

Stellar Phoenix recovers deleted and lost data like documents, music, videos, pictures, e-mail, PDFs and more. It supports recovery from internal (SATA, EIDE, IDE) and external (USB, FireWire, eSATA) hard drives along with USB flash drives, memory cards and iPods. It also supports recovery of Microsoft Office for Mac files and Entourage mails.

Phoenix can recover files by name, creation date, time and sector number. With it, you can check the destination (not the scanned drive) and free space during the creation of images, saving of scans and saving of files.

The software offers support for KDC and CRW file formats — formats used by, respectively, some Kodak digital cameras and some Canon digital cameras. It can show the exact filesize of Apple Mail, HTML, FileMaker, Quick Book, M4V, 3GP and Quark Series, ARW, DNG and ERF file formats.

Stellar Phoenix BKF Recovery 2.0 is available with single user, administrator, and technician licensing options. Pricing starts at US$99 for a single user license. It works with Mac OS X 10.3.9 or higher. It's a Universal Binary, so it runs natively on both PowerPC and Intel Macs.

http://www.stellarinfo.com/mac-data-recovery.htm

REMO Recover (Mac)

Remo makes a series of data recovery software tools for the Mac. Remo Recover (Mac) is designed exclusively for the Mac. The tools have advanced data recovery algorithms, which help to recover: deleted/lost files from (HFS+, HFSX) journaled volumes; inaccessible, formatted or repartitioned Mac volumes; photos, RAW image, music and video files.

This application doesn't affect the volume or the Mac drive that contains deleted data. You always have an option to save recovered data to another volume, external storage or to a mapped network drive. The Remo tools are designed for use with hard drives (IDE, SATA, SCSI), USB drives, FireWire drives, external storage devices, digital cameras, mobiles and other removable storage devices.

The Save Scan info option saves a lot of time when you're using the full version of the software, as the software doesn't have to scan the whole drive again. Plus, it can make use of the Save Scan Info from the trial version session.

Remo Recover (Mac) is available in two different editions, Remo Recover (Mac) Pro Edition and Remo Recover (Mac) Media Edition. The former provides a dual mode of recovery tasks, including photo recovery. Remo Recover (Mac) Media Edition is designed for regular users and for advanced photographers to recover photos, videos, music and RAW image files from portable storage devices and hard drives. The Advanced mode offers scan options to accomplish tasks such as deleted/lost file recovery, formatted/lost volume recovery, from storage devices having healthy or corrupt HFS or HFSX file system.

The Pro Edition costs US$179. The Media Edition is $69. They require Mac OS X 10.4.11 or higher. Demos are available for download.

http://recovermac.remosoftware.com/

LC Technology FileRecovery

FileRecovery from LC Technology is a do-it-yourself data recovery solution for recovering lost and deleted files from all types of media such as hard drives, optical drives, flash media drives, and multi-media or mobile devices. With it you can recover files whether they've been deleted from the command line, from within an application, the file system, or removed from the Trash.

FileRecovery can also recover formatted or misplaced files, drives with a severe logical file system damage — and can even reconstruct lost RAIDs. The Mac version runs natively under Mac OS X 10.4 and higher, and supports all partitions using the HFS/HFS+ file systems. It will also allow scanning and recovery from FAT formatted drives.

The Mac and Windows versions use the same interface; you can access Mac OS X and Windows file systems under either operating system. Both offer the ability to scan all volumes in a local machine and build a directory tree of lost

and deleted files. You can search lost and deleted files matching file name criteria. FileRecovery doesn't write on the drive it's scanning. What's more, saving data to any drive is possible, including network drives and removable media.

FileRecovery's standard write uses a system API to minimize the chance of disk corruption. It offers full access to the network and other installed peripherals and is compatible with Stripe Sets RAID and Mirrored Drives.

FileRecovery is available in three versions:

° Standard ($69.95, one-year subscription license), which will recover from local hard drives, optical media, digital media, and image files — but which won't support RAID recovery or remote access recovery);

° Professional ($99.95, one-year subscription license), which will recover from local hard drives, optical media, digital media, and image files. This version supports RAID recovery, but doesn't support remote access recovery;

° Enterprise ($199.95, one-year subscription license), which will recover from local hard drives, optical media, digital media, and image files. It supports RAID recovery, and remote access recovery via VNC (the viewer and client are included). The $199.95 price is for a single machine license; a commercial license is $299.99 for a one-year subscription.

http://www.lc-tech.com/software/frpromacdetail.html

Prosoft Engineering Data Rescue 3

Data Rescue 3 from Prosoft Engineering is a data rescue utility for Mac OS X 10.4.11 or higher. It works even when your hard drive fails to mount or boot and can rescue data from digital camera media cards as well as hard drives.

The software doesn't attempt any repairs to the drive it's scanning; it focuses on data recovery, not hard drive repair. You will need to save your recovered files to an internal or external hard drive (USB or FireWire), removable media device or a networked drive.

Data Rescue 3 has an extensive list of hundreds of file types it can recover. If the file type you're looking to recover isn't on the list, the software sports a feature called FileIQ that allows Data Rescue 3 to learn about new file types from user-supplied samples. FileIQ works by analyzing your file samples and adding the file patterns so that your User Defined file type can now be located.

Data Rescue 3 enhances your ability to find deleted files in another way: the Deleted Files Scan scans only the free space portion of your drive. This reduces the number of files that you must look for to find particular ones.

There are two ways to run Data Rescue 3. You may run it from the Boot DVD or you may run it as an application, depending on your circumstances. For example, you might need to use the bootable DVD if you have a drive that won't mount or only partially operates. Data Rescue 3 costs US$99 for a personal use license and $249 for a professional use license. To use it you'll need a FireWire, USB, eSATA or external drive to recover to.

http://www.prosofteng.com/products/data_rescue.php

MT

MacSpeech Scribe

Get the (voice) recognition you deserve.

by Dennis Sellers

With MacSpeech's MacSpeech Scribe (http://www.macspeech.com), you can create text documents directly from spoken-word audio files. In other words, it's a personal transcription solution for Mac OS X 10.6 ("Snow Leopard").

It allows you to transcribe your recorded voice into written text with up to 99% accuracy. A built-in Recognition Editor helps increase accuracy by letting you correct your text and train your profile as you use the app.

MacSpeech Scribe is designed for a single person to transcribe a recording of a single person's voice. Alas, the technology simply doesn't exist today to transcribe interactive interviews with two people speaking to each other due to the technical limitations of analyzing multiple voices using a single voice profile.

Still, it's a good time for speech technology products. Within the past decades computers have gained enough power to reliably convert speech into written text. Just about every modern Mac ships with enough horsepower to do this.

MacSpeech Scribe automatically creates an individual speech profile, in one of 13 different English dialects, from an initial recorded sample of the person's voice. A single MacSpeech Scribe license can create and use up to six individual voice profiles, each compatible with all accepted audio file formats. MacSpeech Scribe accepts audio files in .wav, .aif, .aiff, .m4v, mp4, or .m4a formats.

When composing a letter or other document by voice, you can include spoken punctuation, and MacSpeech Scribe will automatically include the punctuation marks in the output text. Audio file quality directly impacts the accuracy achieved and as such MacSpeech Scribe customers are encouraged to minimize background sound and produce spoken-word audio files using a high-quality recording device such as one of the certified recording devices listed at http://www.macspeech.com/recording.

MacSpeech Scribe is available immediately, in English only, at a suggested retail price of $149.

So how is it different from MacSpeech Dictate? Both are personal solutions, but think of it this way: MacSpeech Dictate is TV, and MacSpeech Scribe is TiVo. In other words, both are your voice, but one operates in real time, while the other operates time-shifted via an audio recording that your or an assistant can use.

Also, unlike Dictate, Scribe doesn't interact with other apps. Instead, all text output from the transcription process is placed into a "Note Pad" from which you can copy and paste or save the output to a text file.

PureCM Professional

PureCM Professional, a cross-platform software configuration management solution from PureCM (http://www.purecm.com) gets more powerful with each release. The latest version (2010-1a) sports a range of beefed-up features to support agile application lifecycle management (ALM). ALM products are designed for development managers, product owners, and teams with mixed development methodologies and others who need management visibility of projects throughout the development cycle.

PureCM's planning capabilities fully support working with project releases, iterations and backlogs. The app also automates task tracking, which simplifies parallel development by matching tasks to releases and offers context to any code changes you make.

Another strong point: isolated features. When starting work on a feature, PureCM Professional automatically creates a feature stream and maps the developer workspace against it, so developers don't have to manually create a branch. Also, PureCM Professional automatically updates features with any changes from their parent version as a default. In the event of an update conflict, feature owners are automatically notified via their user Dashboard so they can resolve the conflict using PureCM's visual resolve tool.

Feature owners receive a notification to integrate the feature back into the parent code line as soon as developers complete a feature. PureCM Professional also enables a release history. Features and tasks can be seen in the project history pane—not individual file changes or intermediate submits — so even if a feature has been submitted against multiple times for completion, it only shows up once to allow for easy merging to other versions or even a roll-back.

You can schedule features and tasks via drag and drop from project backlogs. And PureCM Professional simplifies build automation and continuous integration for quick feedback. The software's security policies and user permissions help protect your work and data.

Each module of PureCM (planning, tracking, source control) can be enabled or disabled using policies, allowing for step-by-step adoption. It comes with a proxy server that caches data locally to accelerate data access for distributed teams.

Additional features include multiple performance and ergonomic enhancements for developers. Plus, it's scalable. PureCM supports up to multiple terabytes of data and thousands of connections.

PureCM uses a client/server architecture; a central server stores all data. You access the project data through a variety of clients and can connect from anywhere using TCP/IP. The PureCM server and client are all you need to run PureCM. Of course, you can enhance them with any other components, all of which are included in the PureCM standard license.

The centralized database contains one or more repositories. Administrators can manage who sees and retrieves any or all of the data by defining users and access policies on the server. The PureCM server runs on multiple platforms and can be accessed from clients running on the same or different platforms.

The PureCM client installer includes both the GUI client and the command-line client. The client needs to be installed on each user's machine to connect to the central PureCM server through TCP/IP. Once connected, the PureCM client is used to manage both the server and your local workspace.

The GUI client comes with several visualization tools, such as the diff/merge tool or the file history annotation. Alternatively, PureCM also lets you use your favorite third-party tools. The PureCM client is available for Mac OS X, Windows and Linux; the command line also supports Solaris.

PureCM 2010-1 is available in two editions: PureCM Standard and PureCM Professional. Contact PureCM for pricing info. A demo is available for download.

About The Author

Dennis Sellers is a long time journalist. He started in the newspaper business, but has been in the online journalism business for the past 15 years. He's the editor/publisher of Macsimum News (http://www.macsimumnews.com)

AccountEdge 2010

Acclivity's latest update for small business software

by Dennis Sellers

Acclivity's AccountEdge 2010 (http://accountedge.com/mac/), the latest version of their small business accounting software for the Mac, is a solid update—especially if you need web store integration. Among the new features are integration with Sofa's web store Enstore, more detailed tracking of item information, profitability of a sale analysis, and bank deposit slip printing.

EnStore is the new web store developed by Acclivity's Checkout partner, Sofa. This feature should appeal to anyone that wants to offer their customers a simple, elegant online shopping experience.

EnStore is a pay-as-you-go web store that integrates with AccountEdge. Products, images, pricing and other details are managed in AccountEdge and synced up to EnStore. AccountEdge pulls down new orders, customers, payments and taxes.

EnStore comes with the flexibility to customize your store, automatic shipping and tax rate lookup, hassle-free payment processing through major payment providers and a set of designed templates. EnStore comes with free setup, hosting and unlimited bandwidth and storage. Several store templates come with EnStore; you can add your own pictures and descriptions.

Also, AccountEdge 2010 comes with more robust tracking of item information, including item weight, tagging functionality, brand association, Internet price, and the ability to attach up to three images to an item for multiple viewpoints. You can learn the profitability of a sale with the Show Profit Analysis button. It shows gross profit, margin, and cost of each item you're selling and for the entire invoice. You can change the price per unit to see how it affects margin and profitability. You can show profit analysis from an order, quote, or an invoice.

You can now print out your bank deposit slips, while taking into consideration cash back on deposits, total cash, total checks, and number of items deposited. You can purchase accompanying deposit slips that come pre-printed with your account information, and take your deposit slips right to the bank.

AccountEdge 2010 offers search improvements. In lists, you can search by first name, last name, company name, phone number and more. The new "Search By" feature works for vendors and items, too.

The User Guide and Getting Started Guide are installed and accessible from the Help menu. Of course, you can always seek help from the support section of the AccountEdge web site. The Help menu gives you the choice of going to the website for help or searching the help files included in AccountEdge. Most windows in AccountEdge also include the Help icon, which displays information related to whatever section of the software you currently inhabit.

AccountEdge's Auto Update feature automatically checks for any new software and payroll updates. Plus, you can back-up your file in .zip format, which also allows you to share your file with Windows users.

The software is available through the AccountEdge website and other online outlets, mail order catalogs, and select retailers. AccountEdge is priced at US$299 for new users, and $159 for upgrades ($249 for Network Edition upgrades).

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THE MACTECH SPOTLIGHT

Jacob Gorban

Apparent Software http://www.apparentsoft.com

What's your company?

It's called Apparent Software. Currently a partnership, after I added a partner in the beginning of 2009.

What do you do?

I'm the founder of Apparent Software and the only developer. But since we're only a two-person team, that means I cover all positions, from actually coding our Mac applications and the web site to business operations and customer support.

How long have you been doing what you do?

I've been programming this way or another since around 1988, when I was still a kid. I've sold my first application to a local electronics repair shop when I was still in high-school. Apparent Software was launched in June 2006 when ImageFramer version 1.0 was ready to be sold but I've been full-time on it since only about a year ago.

What was your first computer:

I doubt there is anybody that still remembers my first computer except my father and its maker. It was called "Sogdiana". It was a 4-bit, text-only, connected to a TV computer made by a local manufacturer in Tashkent, Uzbekistan, where I grew up. It was around 1987, I guess. Yet, I learned BASIC on it. Later was another Russian computer, then a ZX-spectrum clone. In 1990 we've got our first PC, an 8-Mhz XT. My first Mac was PowerBook G4 1.67 17", which I've got in 2005.

What is the advice you'd give to someone trying to get into this line of work today?

I'd say go for it. Cocoa development really soared in the last couple of years, mostly because of iPhone. So there's much more literature available now to get you started more easily. The developers are good about helping each other, which results in better software for everyone.

What's the coolest tech thing you've done using Mac OS X?

Being mainly a programmer, I mostly take pride in the cool things that I programmed. My baby project was ImageFramer. It got me started with Mac programming and what made Apparent Software a reality. Today I think the coolest thing is what's already done in ImageFramer 3, which is not yet released. I've got help from a UI designer who mocked its UI and it was both a challenge and a pleasure to convert a Photoshop design into working software.

Ever?

That's a tough one. As a teenage programmer I was very proud when I wrote high-resolution VESA drivers in 8086 assembler, which I then used in Turbo Pascal and built a simple graphical windowing system on DOS, which was then used to create something as stupid a minesweeper clone on DOS. But the whole achievement of integrating ASM, Pascal and the objective-oriented methodologies at the age of 17-18 made me believe that I was good at programming and possibly laid the foundation of what I am today.

From non-programming aspect, the coolest thing I've done was recording and mixing a progressive rock album for my band, which I had between 1996 and 2001.

Where can we see a sample of your work?

All our Mac software is available as trial downloads on our website, at http://www.apparentsoft.com.

The next way I'm going to impact IT/OS X/the Mac universe is:

Last November we created and ran MacGraPhoto, a graphics application bundle for the Mac, which created great value for graphically oriented users of Mac software. This year we're going to run MacGraPhoto 2 and I believe it'll be a better deal this time. See http://www.macgraphoto.com.

Anything else we should know?

As a goal, I try to build Apparent Software into more than one-person shop. The first achievement was when I added a partner who helps me a lot with software ideas, business development, testing and support. This has really propelled Apparent Software to the next level. We've added 2 applications to our portfolio and by year's end we might have a 4th one released. One day I hope to be successful enough to grow Apparent Software into a fine company where several people would collaborate to produce even better software for Apple products.

MT

If you or someone you know belongs in the MacTech Spotlight, let us know! Send details to editorial@mactech.com

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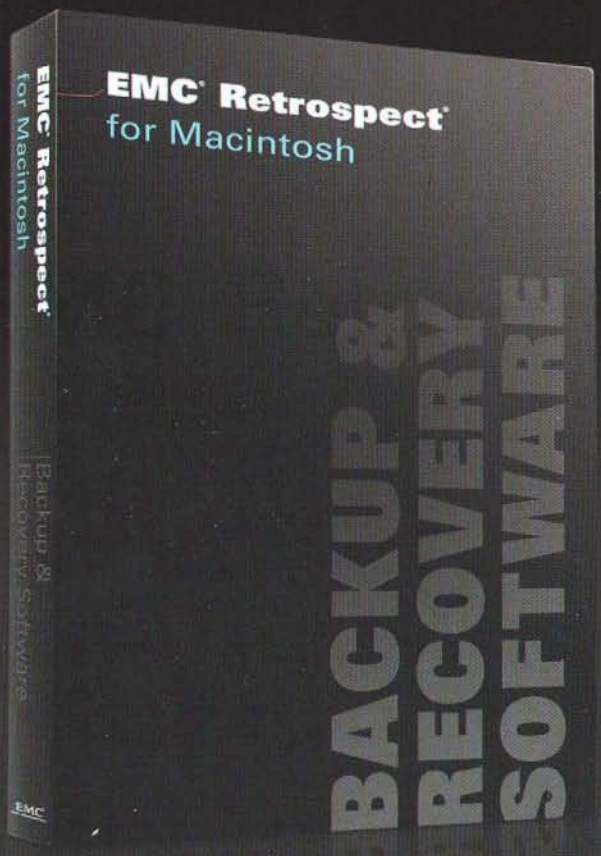
backup and recovery software for small and medium businesses



The most trusted name in Mac backup

All-new EMC Retrospect 8 for Macintosh provides the reliability, ease of use, power, and flexibility you need to protect critical data on Mac and Windows PCs and servers. EMC Retrospect includes a state-of-the-art Mac user interface and enterprise-level features — including remote management of one or more backup servers, disk-to-disk-to-*anything* backups, Xsan support and custom reporting — at a fraction of the cost of other products.

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